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SOVIET NAVAL STRATEGY AND ITS EFFECT
ON THE DEVELOPMENT OF NAVAL FORCES
1953-63



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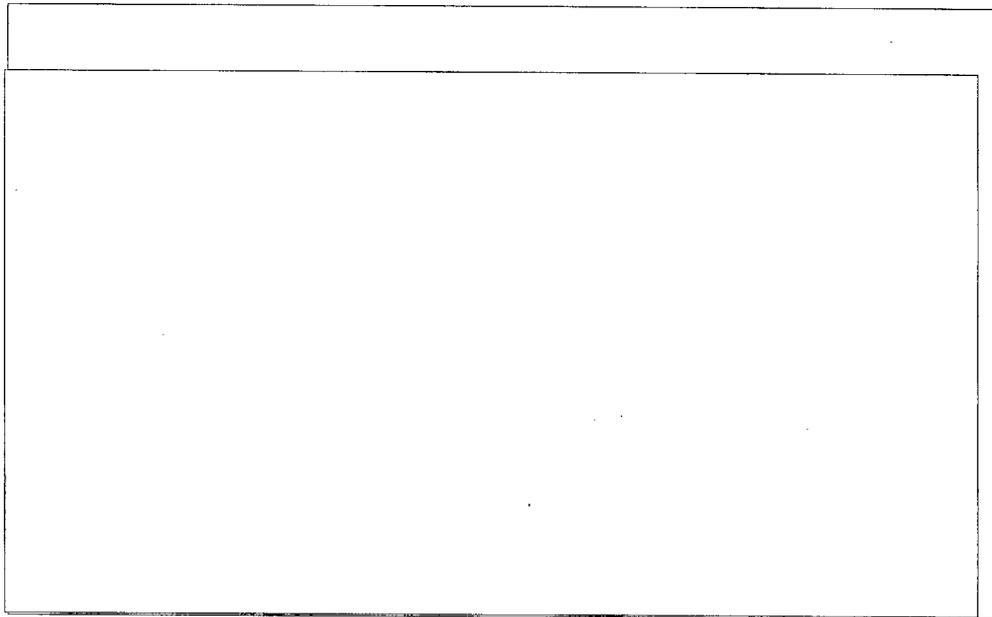
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FOREWORD

All sources of intelligence and, in particular, highly classified articles on Soviet military science and art relating to naval matters, that were published in a TOP SECRET Special Collection* series of the principal Soviet military journal Voyennaya mysl' (Military Thought) have been analyzed in this report for the purpose of deriving current Soviet naval mission, strategy, tasks, policies, and future trends and their effect on the development of naval forces. The Special Collection, when examined in the light of other intelligence, gives considerable information on Soviet capabilities to employ naval forces in a nuclear/missile war and to defend against opposing forces, on Soviet notions about Western naval strategy and capabilities, on weaknesses in Soviet naval strategy and capabilities, and on probable future trends in naval research and development. Although no attempt is made in this report to compare Soviet weapons systems, strategy, tactics, and technical capability with those of the US or to estimate the success or failure of the Soviet Navy in executing naval tasks, some appreciation for over-all capability is developed. Statements on capability are based largely on the strengths and weaknesses stated or implied in the Special Collection and on an evaluation of Soviet naval forces derived from other intelligence. The primary focus of this report is on presenting a well-rounded and detailed view of Soviet thinking on the structure and role of naval forces.

Unclassified statements by high Soviet political and military officers and other statements that have appeared in the open press about Soviet naval forces have been reviewed and found generally to reflect views that are believed to be officially accepted policy. Moreover, when these statements included references to naval weapons, a considerable credibility was given to the statement regarding the existence of the weapons, for the very mention of the weapons would seem to indicate that these weapons either were in an advanced stage of development or had been

* Hereafter referred to in this report as the Special Collection.

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proved to be technically feasible. Extreme caution, however, was exercised whenever these statements were used in this report to estimate current operational capability. In many cases the Soviet statements greatly exaggerated the military readiness in an attempt to convey a highly favorable, although false, image of the military might of the Soviet Navy.

It is not always possible to find precise English synonyms for the military nomenclature used by Soviet naval writers. Even the Soviet authors themselves do not agree on the precise meaning and scope of coverage of some military terms. The editor of Voyennaya mysl, in a preface to the first edition of the Special Collection released early in 1960, referred to the series as "theoretical discussions of the most important and pressing problems of Soviet military science and above all of military art . . . , creative elaboration of pressing, new problems of military art as regards strategy, operational art, and tactics" The conceptual scope of these Soviet terms differs from that of seemingly similar US terms, as shown in the following highly simplified diagram:

US	Soviet
Grand Strategy	Strategy
Strategy	Operational Art
Tactics	Tactics

The term military science has been defined in the USSR as "a unified system of knowledge on preparing and conducting armed struggle in the interest of defending the socialist fatherland against imperialist aggression It studies armament and technology, working out the most effective methods and forms of armed struggle, the basic principles in organizing the army and navy, and the training and upbringing of the

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armed forces personnel. It also takes into account and studies economics and moral, political, and military capabilities of the imperialist aggressors."

In November 1961, Malinovskiy used the term doctrine to refer to the "theses" that he enunciated in his speech before the 22d Party Congress. Malinovskiy established a new trend in the use of this term, and subsequent Soviet commentators have attempted to use the term in a similar manner. A recent Soviet definition of the term military doctrine states that it embraces "unified principled views, views that are of a guiding nature, touching on the nature and aims of a possible war, the basic problems of preparing the country and the people for repelling an imperialist aggression, and the basic problems of organizing and consolidating the combat power of the USSR armed forces and their utilization in war."

The military terminology in this report (with the exception of words and phrases translated from the original Russian in the quotations from the Soviet naval documents) conforms as nearly as possible to US practice, as follows:

Grand military strategy is the science and art of employing all of the armed forces to achieve national objectives.

Strategy embraces all phases of planning, disposition, and general employment of armed forces preliminary to their contact with an enemy force. This term is similar to, although less broad in scope than, the Soviet term operational art.

Strategic defense includes strategic planning directed toward attaining national objectives and the use of armed forces in the large-scale or overall defense of the country by preventing or repulsing attacks by the enemy's armed forces.

Mission is the major continuing duty assigned to naval, air, or ground forces as their part in strategic defense.

Task is a definite, usually operational, objective assigned to a unit or group of units within the naval, air, or ground forces.

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Doctrine refers to officially formulated and accepted principles for the conduct of military operations or principles that are intended or proposed by military theorists for the future conduct of naval combat.

Tactics denotes the maneuvering of forces during combat.

This report was prepared by the Office of Research and Reports (ORR). The Office of Scientific Intelligence (OSI) collaborated in the preparation of the parts dealing with the means used in combat and in research and development of future weapons and technical devices. The over-all analysis and conclusions in this report have been coordinated within the CIA Office of the Deputy Director (Intelligence) (DD/I) and are generally agreed to by the Office of Naval Intelligence (ONI).

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Map

USSR: Naval Fleet Headquarters and Operational Capability of Badger Aircraft inside back cover

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SOVIET NAVAL STRATEGY AND ITS EFFECT
ON THE DEVELOPMENT OF NAVAL FORCES*

1953-63

Summary and Conclusions

Since the death of Stalin in March 1953, concepts of Soviet grand military strategy have been subject at times to widely divergent views among high Soviet political and military officials. The debate appearing in both classified and unclassified Soviet publications has included some discussions of the role of the Soviet Navy in grand military strategy and the use of the Navy for delivering nuclear weapons. A review of historical intelligence since World War II and a critical analysis of important intelligence received since late in 1959 have led to the following conclusions about current and future Soviet naval strategy.

A. Mission of the Soviet Navy Under Stalin

Up to World War II the main mission of the Soviet military had been the defense of the homeland. As the USSR had always been a land power, it considered the ground forces, and particularly the infantry, to be the principal element of military power. Naval and air forces were designated to assist the ground forces in their operations.

The prewar concept was not appreciably altered by World War II, but with the elimination of German and Japanese military powers, the principal source of opposing power now rested in the North American continent. This caused the strategic missions of the military to be appreciably altered. Although Soviet strategy as a whole continued to be oriented primarily toward the Eurasian (chiefly Europe and the Near East) land mass, the mission of

* The assessments in this report represent the best judgment of this Office as of 1 August 1963.

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the Soviet Navy was enlarged from the task of supporting ground troops in seaward flank operation to interdicting supply lines between the US and hostile European and Asian countries.

A leading Soviet Admiral, V. A. Alafuzov, writing in August 1946, revealed what was then generally considered the postwar mission of the Soviet naval forces, observing that the fleet is called on to fulfill the following basic missions:

1. Defense of its own sea communications;
2. Interruption of the sea communications of the enemy;
3. Defense of its territory against invasion by the enemy from the sea;
4. Invasion of the enemy's territory from the sea;
5. Defense of its shore installations;
6. Destruction of the enemy's shore installations; and
7. Support of the flanks of the army.*

The inclusion of the task "invasion of the enemy's territory from the sea" may have reflected a desire within the Soviet Navy for development of a force structure similar to the World War II navies of the US and UK whereby the military forces of the USSR could be moved over the oceans. (Early Soviet plans even envisioned the building of aircraft carriers, but these plans were abandoned.) Subsequent developments show that the concept of this task was reduced in scope to include only the Eurasian areas.

Because Stalin believed the basic nature of war would remain unchanged and that the mission of the Navy should be strictly defensive, the large naval fleet that was developed under his guidance and that of the Commander in Chief of the Soviet Navy, Admiral Kuznetsov, was designed somewhat along the lines of World War II naval forces.

Although some progress had been made under Stalin in the development of missiles and nuclear power, there was little evidence that much progress had been made in reshaping official military strategy and doctrine to meet the challenge of the missile/nuclear age.

* Voyennaya mysl', no 8, 1946, pp. 19-20.

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B. Development of Soviet Naval Strategy from March 1953 to Fall of 1959

The death of Stalin in March 1953 offered the opportunity for sweeping reappraisals of political, economic, and military matters and called into question many of the policies which Stalin personally supported. In the military field, his death offered the opportunity, long overdue, to devise new strategy more suitable to the changing world concepts for waging war and unleashed debate on theoretical military science. The Soviet military press undertook a systematic program to educate military officers and other responsible personnel on the character and potentialities of new weapons and military technology and to induce responsible officers to write on military science and art.

By 1955, high Soviet military and political officials, recognizing the potentialities of nuclear power and new weapons, criticized the capability of the Soviet conventional fleet to defend the USSR in a future nuclear/missile war. The criticism was based not only on the lack of integration of nuclear power and missile weapons systems in its ships but also on the lack of its ability to counter the emerging threat, particularly nuclear, of the greater striking power being developed by the US Navy. It became clear that Soviet naval strategy and policies were about to be revised drastically. The problem before the Soviet Main Naval Staff was one of determining the character and magnitude of the threat likely to be posed by the probable enemy and then attempt to develop the required naval organization, strategy, tactics, and weapons to counter these threats.

Soviet military publications began to emphasize in 1955 the importance and value of submarine-launched missiles. During the visit of Khrushchev and Bulganin to London in May of 1956, Khrushchev stated that guided-missile submarines are the most suitable naval weapons and that they will receive emphasis in future development of the Soviet Navy. Khrushchev reportedly added that possession of this weapon would give the USSR the capability of making "defensive" attacks on the US. In May 1956 the Soviet military publication Krasnaya zvezda (Red Star) contained the following statement: "Submarines having atomic propulsion and guided missiles as basic armaments can perform at great distances from their bases and secretly strike blows not only against ships but also against land targets deep in the territory of the

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enemy." At that time, Khrushchev apparently viewed the submarine as a potential vehicle for the delivery of nuclear strikes against the American continent.

Because of the growing potential of the Navy's role in over-all military strategy, a gradual change also took place in the attitude of high Soviet officials toward the Soviet Navy, and support was mustered to rebuild the Soviet fleet along modern lines by integrating nuclear power and missile weapons. Emphasis was placed on construction of submarines and in particular on ballistic-missile-launching submarines.

One of the immediately apparent changes, which resulted from the critical examination of the then current shipbuilding program, was the abandonment and phasing-out during 1955-57 of all the naval shipbuilding programs, with exception of a patrol boat program, that were underway in 1955. Soviet expenditures on the construction of naval ships decreased sharply from the equivalent of \$1.9 billion* in 1955 to about \$0.8 billion in 1957. This drastic action cleared the way for the building of a modern fleet.

The new ships built since 1955 have included both diesel-powered and nuclear-powered submarines armed with torpedoes, diesel-powered and nuclear-powered submarines armed with surface-to-surface missiles (SSM's) of both ballistic and cruise types, destroyers equipped with surface-to-surface cruise missiles and surface-to-air missiles (SAM's) and a large number of patrol boats armed with SSM's of cruise type. In addition, modernization programs of the conventional fleet have improved its capability by equipping some ships with cruise-type SSM's and SAM's. An over-all improvement, in both the new and modernized ships, in electronics and anti-submarine warfare (ASW) capability has been noted. The building of these new ships and the modernization of existing ships represent a major qualitative improvement in the Soviet fleets. Because of technological improvements that are being made continually in ship propulsion systems, missile weapons, torpedoes, and electronics, it is entirely possible that the USSR will not choose to mass produce any single design in the near future on a scale comparable to the construction of programs of the Kuznetsov period in the first half of the 1950's.

* All dollar values in this report are in terms of 1960 US dollars; ruble values are in terms of old rubles.

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C. Soviet Writings and Discussions of Naval Strategy, 1959 to the Present*

From 1953 to the end of 1959 the Soviet military debate was centered largely around the effect on the military of the rapidly advancing weapons technology. During the early part of this period the main emphasis was on how to adapt the new weapons to traditional concepts, and as more and better weapons became available, it became necessary to modify traditional concepts to suit contemporary trends in military science and art. By the end of 1959, when the potential of long-range ballistic missiles was being realized, some Soviet political and military leaders began to express their thinking on mass destruction and increasing reliance on this weapon system. Much of this trend was opposed by the more conservative, or "traditionalist," elements of the military. Khrushchev, viewing the potential of this new weapons system as a means of providing greater security for the USSR, outlined in his report to the Supreme Soviet in January 1960 a new military policy. The essence of his plan was to place main reliance on nuclear-missile forces, to reduce military manpower substantially, and to accelerate the retirement of older weapons. This, he asserted, was the force structure best suited both to deter war and to fight one if necessary. Moreover, among other armed forces, surface naval forces would soon become obsolete. Khrushchev's speech probably was drawn up after consideration of this policy by the Central Committee of the Communist Party in December 1959.

Although Malinovskiy generally supported Khrushchev in a speech to the same Soviet a little later in the month, Malinovskiy warned against overreliance on nuclear-missile forces and expressed the opinion that a successful conclusion of a war would depend on the use of all types of armed forces. Malinovskiy, in his speech before the 22d Party Congress in November 1961, stressed even more the need for joint action by all forces and the requirement for mass armies and stated that the most important task of the armed forces was to be "in constant readiness to repel an attack by the enemy" and to be capable of "breaking up the aggressive designs [of the enemy] and dealing him a crushing blow in time." Khrushchev modified his position considerably between January 1960 and November 1961, moving away to some extent from a one-sided policy and yielding to a position more favored by the military in general.

* For a discussion of the use in this report of the recent Soviet publication Military Strategy, see the footnote on p. 31, below.

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Late in 1959 the Soviet leadership, apparently motivated by the critical necessity for reviewing current (1959) military strategy in the light of weapons development, intensified the drive for creative military thought and instituted a "military-theoretical conference by correspondence." One forum was the open military publications. The "widest circle" of Soviet officers were enjoined to participate in promoting the advancement of Soviet military concepts. In addition, a classified forum was set up for relatively free-ranging discussions of military problems.

With a view to activating theoretical discussion of the most important and pressing problems of "Soviet military science, and above all of military art," Malinovskiy authorized the publication of a TOP SECRET Special Collection* series, in addition to the currently published SECRET version of the top Soviet military journal Voyennaya mysl' (Military Thought)**. Distribution of the Special Collection would be restricted to a limited circle of officials, from army commanders upward according to a special list. Leading personnel of the armed forces, the troops, the military academies, the chief and central directorates, and the General Staff who could contribute most to the development of Soviet military theory in the light of the requirements of modern warfare were invited to write articles for this Special Collection.

Among the many articles written over a period from early 1960 to mid-1962 were 12 articles about naval matters by 10 naval authors. The biographic data available on these authors show that all are of senior rank. However, only one, Admiral Kasatonov, Commander in Chief of the Northern Fleet, is known to have held an active operational command at the time he wrote for the Special Collection. Although one of the authors is identified as head of a naval war college and another as one the editorial board of the important military publication Morskoy sbornik (Naval Journal), the rest are either in unidentified posts or retired. Up to mid-1962, no article by an officer less senior than captain first rank was published; therefore, little comparison could be made with the thoughts of younger officers.

* Hereafter referred to in this report as the Special Collection.

** For a brief description of this periodical, see Appendix B.

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The Soviet naval authors who wrote for the Special Collection seem to view a future war as one of some duration and, therefore, one involving extensive use of naval forces. These authors believe the over-all military requirement necessitates the expansion rather than a reduction of naval forces. Furthermore, they seem to support a more conservative military position on strategy and policy, rather than the more radical position outlined by Khrushchev in January 1960.

The discussions as a whole seem to have generated a number of disputes about strategic and tactical theory and outline many problems including those of coordination of military-scientific technical work, military-economics, research and development, over-all weapons evaluation studies, and the modernization of communication and support.

An over-all impression gained from the articles by the naval authors is that the mission of the Soviet Navy in grand military strategy has been formulated and coordinated by the Supreme High Command. This is not to say that some parts of the mission will not be expanded with advances of weapons technology, but it is believed that the basic concepts will hold for the next 10 to 15 years. The mission, therefore, apparently has not been considered a subject for debate. The vigorous and critical debate that is carried on in the naval articles is confined largely to basic strategy, or, in Soviet terminology, to "operational art." The arguments include some criticism of the organizational structure and management of scientific-technical research and military-economic studies, but the major part is devoted to theories for developing strategy, tactics, and forces to accomplish the specified tasks of the Navy. The naval authors do not always agree on the strategy for accomplishing a specific task. Although some rebuttal statements are interspersed in the articles, there are two articles largely devoted to rebuttal arguments.

The naval authors have consistently complied with the request that the discussions be theoretical. This compliance is further emphasized by the omission, except in a very few instances, of identification by name or project number of any naval weapon or weapons presently in the fleet or under research and development. The authors also were requested to "propose realistic solutions." Implicitly imposed on the authors was the responsibility to consider forces that were technically

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achievable by Soviet industry. Most of the authors adhered to this premise; however, some proposals, although scientifically possible, may not be technically achievable within the foreseeable future. Because the "solutions" embody both strategy and means and because the authors do not always agree on the solution for accomplishing a specific task, it is difficult at times to judge specifically which concept is more likely to govern. Nevertheless, it has been possible generally to identify the main trends in current naval strategy as well as the issues that still have to be settled.

D. Current Soviet Naval Strategy

The basic mission of the Soviet Navy has been enlarged since 1946 to include the strategic defense of the USSR against attacks from the sea by strategic attack carrier groups and Polaris submarines and to engage in missile attacks against foreign territory. The Soviet Navy still retains the more traditional roles of the basic mission such as interdicting the sealines of communication of the enemy, defending the littoral of the USSR, and providing support for the seaward flanks of the ground field forces. The current development of naval forces indicates that the USSR is placing great emphasis on the development of naval forces to accomplish the current mission.

The huge NATO naval force, ranging from landing ships to the strategic attack carrier groups and Polaris submarines together with an enormous merchant marine, presents a formidable seaborne force arrayed against the Sino-Soviet Bloc. As this is a mobile force, it cannot, at present, be a target for the Soviet Strategic Rocket Forces. The destruction of these forces, therefore, is assigned to the Soviet Navy.

Because there is no evidence supporting the existence of a Soviet plan for waging ground warfare on the American continent, the scope of the mission of the Soviet Navy does not provide for naval forces, principally surface groups, superior or even comparable to the navies of NATO, whereby the military force of the USSR may be moved over the oceans in face of the opposing naval force of NATO.

While the mission of the Soviet Navy may be viewed within a concept for the development of general purpose naval forces, there is no

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evidence that the USSR considers that there is a need to develop naval forces to protect sealines of communications in time of war to remote areas such as Cuba, Laos, and Africa.

Eventhough each of the four Soviet fleets has a force consisting of submarines; reconnaissance and medium bomber aircraft; coastal defense units (SAM's and SSM's); and surface ships of cruiser, destroyer, escort, patrol, and mine warfare types; Soviet naval officers consider these forces to fall far short of those required for successful accomplishment of their assigned tasks, particularly in ocean areas beyond the local sea theaters.*

The continued emphasis on the development and construction of long-range submarines, particularly nuclear-powered, and of missiles of both cruise and ballistic types to be fired from submarines, suggests that over the long run Soviet naval policy will shift from the long-held policy of defending the Soviet homeland in Eurasian (particularly Europe) littoral waters to a policy of attempting to counter the "aggressor" in waters and bases farther from Soviet shores, even to the shores of the US.

The naval authors base their theoretical strategy for expanding submarine warfare on the performance capabilities of nuclear submarines. Diesel submarines are considered by the naval authors as being too limited in performance capability to engage effectively in combat either with attack carrier groups or with Polaris submarines, particularly in areas beyond the local sea theaters. The continuation of the present construction of diesel submarines in the USSR, however, seems to indicate that the full implementation of this policy is not feasible even at this time.

1. Strategy of Surprise and Preemption

Soviet naval authors seem well attuned to the tenor of current Soviet discussions of over-all nuclear strategy and accordingly urge the development of naval forces sufficient to "frustrate" an attempted attack on the USSR by NATO's naval forces -- in particular, by attack carrier

* For the order of battle of the Soviet Navy, see Appendix D. For the locations of fleet headquarters, see the map inside back cover.

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groups and Polaris submarines. The authors discuss and seem agreed on the growing importance of being able to find and counter enemy naval forces on a timely basis far from Soviet territory or waters. At the same time they seem well aware of current limitations, and they offer collectively a wide variety of conceivable solutions.

The strategy of preemption appears consistent with the current mission of the Soviet Navy in that it views the role of the Navy as one of preventing or blunting an attack on the USSR from the sea. The task of strategic strike in the initial period of the war seems inconsistent with the naval forces in being, because of the relative short range of operational submarine-launched missiles and because a large part of the missile submarine force is diesel-propelled. However, in light of recent developments which indicate the probable creation of a strategic strike capability in nuclear submarines, the current mission of the Soviet Navy may be expanded to supplement the mission of the Strategic Rocket Forces.

Development of Soviet naval forces designed to be in a position to attempt to frustrate an attack at any time would require the construction of a force consisting principally of nuclear-powered submarines equipped to fire anti-ship cruise missiles and torpedoes armed with nuclear warheads, and an ASW force consisting of both submarines and surface ships -- including merchant and fishing ships -- all of which would be augmented by reconnaissance, ASW, and missile-carrying aircraft. Furthermore, these forces would have to be deployed in peacetime within the strike range of the take-off lines of aircraft from NATO's carrier task forces and the launch areas of Polaris missile submarines. The construction of such a force and the continual deployment would achieve two Soviet objectives: (a) having a force at sea in a continual state of combat readiness so that whenever the USSR considered the situation of threat by NATO forces to be so clear as to indicate the inevitability of a strike against the USSR, Soviet naval forces could initiate a preemptive blow to these NATO forces, (b) having a mobile nuclear strike force continually at sea and away from fixed bases thereby achieving anti-nuclear dispersal in case of a NATO surprise strike.

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2. Development of a Submarine Strategic Strike Force

Significantly the Special Collection contains very little discussion of or arguments for the development of a strategic strike force of ballistic missile submarines similar to the US Polaris submarine. The absence of arguments, even for the development of such a force for a deterrent, which here may be considered of greater political than military significance, may be explained in one or more of the following ways:

a. The task itself apparently was not assigned currently to the forces of the Soviet Navy, perhaps because of the inadequacy of the types of submarine missile systems operational at the time;

b. The task, although assigned to naval forces, is not under the exclusive command of the Soviet Navy; therefore, there is no need for developing strategic planning for naval commanders.

c. A tacit understanding among Soviet naval officers that accomplishment of this task was not a subject for discussion in the naval debate over the means by which the tasks of the Navy would be accomplished, or that such discussions were so sensitive that they were being carried on under even greater security restrictions;

d. Top Soviet leadership thought that the IRBM and ICBM programs would be adequate for total strategic strike purposes. This last possibility, however, seems to be contradicted by evidence of developments both in the land-based programs and in the Soviet Northern Fleet Missile Test Range in 1962 and early 1963.

In spite of the omission in the Special Collection of the consideration of a proposal for developing a strategic strike force of long-range ballistic missiles launched from submarines, high-level support is being given to accelerated research and development to significantly improve the strike capability of ballistic-missile submarines. Evidence indicates that since early in 1962 the USSR has conducted a number of firing tests in the Northern Fleet Area of a new ballistic missile that, for the first time, is fired from a totally submerged submarine. The range of this new missile is far in excess of the 350 nautical miles (nm) type of ballistic missile (SS-N-4) presently operational in some Soviet

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submarines. The estimated range of the new missile is about 650 nm. It is entirely possible that the testing program underway in the Northern Fleet Area may lead to two significant developments: (1) improvement of the current Soviet capability for firing ballistic missiles having a range of 350 nm from surfaced submarines to a capability for firing to a range of at least 650 nm from totally submerged submarines; and (2) the development of a long-range (possibly as much as 1,800 nm) strategic strike capability. The exhibition in the Moscow parade on 7 November 1962 and more recently in the parade on 1 May 1963 of a 48-foot naval ballistic missile that the USSR claims can be fired from above or below the surface of the water is another indication of the probable development of a long-range ballistic missile strike force.

The Soviet press agency Tass referring to the parade of 1 May stated: "Soviet industry has equipped the Navy with powerful long-range rockets capable of firing a salvo at any time from a submerged or any other position and delivering a nuclear warhead to any point on the largest continent."

These events confirm a continuing program of research and development for substantially improving the capability of the Soviet Navy and in particular that of the ballistic-missile-launching submarine. These developments are major advances in the military capability of the Soviet Navy and may portend the expansion of Soviet submarine tasks to include that of participating in initial attacks on strategic land targets.

3. Trends in Soviet Submarine Construction

Apparently it was clear to Soviet naval leaders in 1954 that combat with NATO's attack carrier groups, nuclear submarines, and the interdiction of supply and communication lines required submarines of greater range and combat capabilities than those available in the large fleet of diesel-powered W-class or in the small group of Z-class. During the period 1954-56 the design of two classes of improved long-range diesel submarines and of three classes of nuclear-powered submarines was begun. Production of these five classes has continued through 1962.*

* The rate of production of the nuclear-powered submarines is as follows: one in 1958, four in 1959, seven in 1960, seven 1961, and eight in 1962.

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The continued production of diesel-powered submarines to the present time may be attributed to a combination of factors. Soviet naval leaders having in mind the future extension of the range of Polaris missiles apparently feel an even greater need now for additional numbers of long-range submarines deployed further from the shores of the USSR. Such deployment can be accomplished to a significant extent even with the use of improved longer range diesel-powered submarines. The current Soviet rate of production of nuclear submarines would not provide the numbers that the Soviet naval leaders believed to be required within the time limit they believe necessary to offset the threat from Polaris submarines and attack carrier groups when it reaches its maximum about 1967.

The USSR has not shifted completely to the production of only nuclear-powered submarines, as did the US in 1956.* Since 1960 the USSR has completed about 40 diesel-powered submarines. The rate of construction of nuclear submarines over the past 3 years has been rather steady at 7 or 8 units per year. This rate may reflect the maximum economical annual capacity of developed facilities for the production of critical components for nuclear submarines. The shipyards that currently are building nuclear submarines also are participating in the production programs for diesel submarines. These shipyards have a combined capacity to produce at least twice the number of nuclear submarines that currently are being produced. It is believed, therefore, that any significant increase in production probably would first result from the allocation of additional economic resources for expanded critical component production facilities, but there is no evidence of such expansion at present.

Evidence indicates that some nuclear submarines have experienced failures in their propulsion systems. However, the annual rate of production of nuclear submarines has not declined as sharply as would be expected if exceedingly major difficulties were being encountered. Rather it appears that these problems are of the nature that imposes an additional load on production facilities for the special components of nuclear submarines through the necessity of more frequent repairs and replacement of parts.

* The last construction contract for building a diesel submarine in the US was awarded in mid-1956.

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In view of the apparent urgency of the nuclear submarine program, indicated not only by the authors of the Special Collection but also in other intelligence, it is expected that the rate of production will increase in the future through the resolution of technological difficulties and through capital investment in additional facilities for the production of components.

E. Specific Tasks of the Soviet Navy

There is considerable discussion in the Special Collection about strategic theory and the best means for accomplishing the separate tasks, all of which, however, are tailored to fit the basic concept of the naval mission. Considerable attention is given to the means, with particular reference to weapons, to be used to accomplish a given task. The solutions proposed by the naval authors presuppose certain theoretical strategy and tactics. It is therefore necessary to understand fully an author's theory before a full evaluation can be made of his proposals. It is not the intent of this report to argue the merits of each author's theory but to examine those theories that are judged to be the most likely to influence the development of forces and the means to accomplish the several tasks.

Soviet naval officers generally are agreed that the most important specific task in the initial period of a war is to prevent or blunt a nuclear attack on the USSR from NATO's attack carrier groups and Polaris submarines.

F. Destroying Attack Carrier Groups

Before the development of the US Polaris submarine, the greatest seaborne threat to the USSR was the attack carrier groups. The destruction of this force, therefore, was the task of highest priority, and it was against this force that the USSR developed its greatest naval defensive capability. Soviet documents discuss countering attack carrier groups in terms of three principal areas:

1. Take-Off Line of Carrier Strike Aircraft

The take-off lines for carrier strike aircraft must, under most circumstances, be within 1,000 nm of the USSR for strikes, even against

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peripheral targets. Obviously the area within the take-off line of carrier strike aircraft is considered the most critical, but it also is the area in which the Soviet Navy has at least some current defensive capability. It is in this general area that Soviet preemptive strikes against carriers would be made and where forces may be continually deployed. Forces that can be employed now to some extent and forces that are planned for future employment in this area include reconnaissance aircraft; aircraft armed with ASM's; and reconnaissance, torpedo, and cruise missile submarines with either nuclear or diesel propulsion. It is principally in this area that joint operation of aircraft and submarines will be carried out. The withdrawal of tactical fighter aircraft from the Soviet Navy in 1959-60 means that combat with the carrier strike aircraft in flight is left to the air defense forces (PVO Strany). Apparently there are no plans for the use of the Soviet surface fleet in strikes against carrier attack groups on the open oceans.

2. EnRoute to the Take-Off Line of Carrier Strike Aircraft

This area covers sea and ocean areas between bases and the take-off line of strike aircraft. As mentioned earlier, attack carrier groups must, in most circumstances, come within 1,000 nm of the USSR and, therefore, must operate for considerable periods in areas that can be reached by Soviet medium bombers. The Soviet missile-configured Tu-16 (Badger)* has an optimum unrefueled combat radius of 1,600 nm and, with air refueling -- a well-established capability in naval air regiments -- this aircraft has an optimum combat radius of 2,300 nm. Soviet naval authors have argued for long-range aviation to be made available to the Soviet Navy to accomplish reconnaissance in the more distant area of the oceans. Recent long-range reconnaissance flights of the Tu-95 (Bear)* aircraft (both reconnaissance types and the types that carry ASM's) over US carriers indicate that some capability in this area probably has been made available. The missile-equipped Tu-95 has an unrefueled combat radius of 3,900 nm. Operating independently and jointly with aircraft will be both the nuclear-powered and diesel-powered submarine forces. Beyond the range of Soviet long-range aircraft, the capability to detect and engage carrier groups is

* For photographs of selected types of Soviet aircraft and naval vessels, see Appendix C.

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limited to nuclear-powered submarines and to the F and Z classes of long-range diesel submarines. Possible future means of aerial reconnaissance even include earth satellites and reconnaissance missiles.

3. At Bases

Because the bases for aircraft carriers are fixed targets, debate has centered on whether attack against naval bases should be the task of ballistic and cruise missile submarines or the task of the Strategic Rocket Forces. The designation of this task is yet to be resolved. Factors that bear on the allocation of targets are the character and strength of the enemy's defense protecting a single base, the cost and effectiveness of missile submarines versus land-based ballistic missiles, the vulnerability of launching platforms, and the availability of means in relation to priority of targets at the time of required strikes. The major advances in submarine-launched ballistic missiles that have been noted recently in activities at the Northern Fleet Missile Test Range would indicate that in the near future more shore targets might be assigned to submarines.

G. Destroying Polaris Missile Submarines

The rapidly growing fleet of US Polaris submarines, the increasing range of Polaris missiles, and the extremely low vulnerability of this nuclear strike system have caused the USSR to consider this threat as extremely serious.

The Soviet naval authors view the Navy's role in countering this relatively new threat as one of destroying the missile launch platform -- the Polaris submarine. There is no discussion by those naval authors about the destruction of the Polaris missile; apparently there is a tacit understanding that this task is left to the ABM forces of the USSR.

The naval authors seem to confirm recent intelligence estimates which assess the present Soviet capability to detect and destroy submarines operating more than 100 nm from their coastline as extremely low. The Soviet naval authors recognize that the probability of successfully accomplishing this task is much lower than countering attack carrier groups and that the complexity and cost of developing defense systems for this new task is great.

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Strategy for ASW, particularly in sea and ocean areas beyond the immediate Soviet coastal areas, is not believed to be completely worked out as yet. The probable strategy for actively combatting Polaris submarines seems to be divided into zones of defense much like those considered for attack carrier groups. These zones include the Soviet coastal areas, which have been referred to as the "near zones"; the sea and ocean areas where the Polaris submarines will launch their missiles, which have been called the "far zones"; the ocean areas between the bases and launch zone; and the bases and shore communication facilities.

The probable strategy for actively combatting Polaris submarines in the area of the launch zone includes antisubmarine defense being carried out by antisubmarine submarines, aircraft (airplanes, seaplanes, and helicopters), and surface ships. These forces would be deployed in echeloned ASW barriers, the density of which would be determined by the magnitude of threat. The nuclear-powered antisubmarine submarine is recognized by the naval authors as the most potent ASW weapon at the present time, although few are available in the present order of battle. One writer also complained pointedly that the construction of nuclear-powered ASW submarines was receiving insufficient emphasis, with too much emphasis having been given to missile-carrying nuclear submarines.

For the initial detection of submarines, it appears that the USSR probably will rely more on a combination of mobile platforms -- submarines, surface ships (both naval and nonnaval), aircraft, and acoustic buoys -- than on large fixed hydrophone systems, such as the extensive Sound Surveillance System (SOSUS) of the US. The naval authors consider that submarines with improved sonar equipment will be the principal surveillance platforms. These surveillance submarines will be supplemented by ASW surface ships carrying helicopters equipped with detection equipment and/or ASW weapons. One of the technological gaps existing even to the present time is lack of improved sonar. US intelligence estimates indicate that the USSR lags behind the US in the development of sonar equipment and underwater electronic devices.

The means of protection against hostile aircraft presently available to the USSR for its ASW surface ships is quite low, but intelligence shows that Soviet policy is directed toward efforts to overcome this and other

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deficiencies rather than to deemphasize the role of surface ships in ASW. Improvements in ASW capabilities of surface ships are being observed constantly, both against hostile aircraft and in ASW weapons.

The naval authors recognize the capability of aircraft using magnetic anomaly detection (MAD) equipment and sonobuoys to identify and localize submarines and quickly to concentrate attacks on submarines with "anti-submarine aerial bombs with a special (nuclear) charge" and antisubmarine aerial torpedoes. They also recognize as shortcomings of ASW aircraft the absence of improved airborne detection equipment, the low endurance of both airplanes and helicopters, weather conditions, the status of airfield basing (the naval authors advocate seaplanes over wheeled aircraft because of the advantage of water landing), and the limited capability of aircraft operations in the Arctic.

In support of the strategy for preemptive attack, it is to be expected that more ASW forces will be deployed in peacetime along the missile launch zones for Polaris submarines. Increased use of fishing and merchant ships for detecting and early warning duty also is contemplated by the naval authors.

The naval authors recognize that there exists little present capability for detection of Polaris submarines between the Polaris bases and the launch areas of their missiles and point to the necessity for developing a capability to keep hostile submarines under surveillance, even in peacetime.

Because of lack of capability to counter Polaris submarines at sea, the naval authors give considerable thought to destroying shore communication facilities and Polaris bases, including the submarines berthed in them. Like the discussion of destroying attack aircraft carrier bases, the debate on Polaris bases revolves around whether these bases should be targets for the Strategic Rocket Forces or of missile submarines.

H. Destroying Land Targets

The destruction of land targets by naval forces is a relatively new task for the Soviet Navy, and the policy concerning it apparently has not yet been resolved. Moreover, it is the least clearly defined policy of any that is discussed in the Special Collection.

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As mentioned earlier, Khrushchev in 1956 apparently viewed the submarine as a potential vehicle for the delivery of nuclear strikes against the North American continent. Other intelligence indicates that a decision was made late in 1954 or early in 1955 to go ahead with a program to build ballistic-missile submarines. The program consisted of the design and construction of two new classes of ballistic-missile submarines, one diesel-powered and the other nuclear-powered. In addition, a part of the diesel-powered fleet attack submarines under construction were converted or completed as missile launching submarines. The decision to move ahead with these programs before any operational experience was gained from a prototype emphasized the apparent urgency for the development of this missile delivery system and seemed to indicate that Khrushchev's view had been adopted. With the exception of the conversion program, the construction of the two new classes has continued at least through 1962. The ballistic missile that is currently operational in these submarines has a maximum range of about 350 nm and is fired when the submarine is in a surfaced position. It is believed that nuclear warheads of [REDACTED] [REDACTED] yield will be available for these missiles in case of a hot war. In addition, the USSR began a program about 1957 to build nuclear-powered cruise-missile submarines and, in 1959, to convert some diesel-powered submarines to cruise-missile submarines. The cruise missile that is currently operational in these submarines probably has a range of about 300 nm with a nuclear warhead of [REDACTED] yield when used against land targets.

One naval author states that a decision was made before May 1961 to free submarines from the task of participating with missile troops of strategic designations in strikes against deep enemy objectives because of the advent of the ICBM. This decision could have resulted from a redistribution of targets that was brought about by the formation about January 1960 of the Strategic Rocket Force Command and the relatively short range of the submarine missile at that time.

An examination of the articles in the Special Collection reveals discussion about whether land-based ship support facilities (principally bases and command control stations of NATO's naval nuclear strike forces -- attack carrier groups and Polaris submarines) should be a target for the Navy or the Strategic Rocket Forces. Many of the naval authors strongly imply that the nuclear-powered submarine has a

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considerable potential for ballistic missile warfare and that they could advantageously complement the "missile troops of strategic designation!" The current development of more advanced submarine missile systems is consistent with this view.

I. Interdicting Supply and Communication Lines

The Soviet Navy has had the task of interdicting supply and communication lines of the enemy since shortly after World War II. It was apparent to the USSR that the potential enemy was across the seas on the North American continent and that any action by the USSR against Western European countries would certainly invoke US support.

Because of the time required to organize supply lines in case of war, the naval authors seem to agree generally that this task is of secondary importance in the initial period of a war. However, considerable debate is focused largely on the timing of strikes, on where communication lines should be hit, and on the methods to be used. Apparently no special forces are being developed by the Soviet Navy to interdict supply and communication lines other than those already planned to be used against attack carrier groups and Polaris submarines and in conducting tasks in the sea areas contiguous to the Eurasian land mass.

J. Sea Areas Contiguous to the Eurasian Land Mass

The Soviet Navy has long had the following tasks to perform in nearby sea areas:

1. Defense of the USSR against invasion from the sea;
2. Support of ground forces;
3. Conducting landing operations on shores of the Eurasian land masses and nearby islands; and
4. Protection of sea supply and communication lines of the USSR.

These tasks are intermingled to a greater or lesser extent according to the military objectives. Because of Soviet orientation toward Western Europe, these tasks are of considerable significance to the naval forces of the Black Sea and the Baltic Sea. Indeed, they are the only justification for the large naval forces the USSR maintains in these closed sea theaters.

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Although Soviet surface naval forces play an important role in these tasks, battleships, cruisers, and destroyers currently are viewed by the USSR as having completely lost all combat value and as having no prospects of use as a naval striking force. The principal strike role has been given to submarines. The naval authors view other surface forces as a defensive force composed of ships carrying missiles and helicopters for use in ASW, in support of basing and deploying naval forces, in defense of naval communications and the coastline from attacks by enemy surface ships, and in resolving other tasks. Submarines also provide important support in screening surface fleet activities. The development of forces, particularly surface fleets, since 1957 has been generally along the lines advocated by the naval authors in the Special Collection.

There is little debate among the naval authors about the strategy or the development of forces for carrying out these tasks. Only two authors* make any significant contribution to this subject -- both devote considerable attention to the necessity for integrating missiles, both SSM's and SAM's, into the surface forces of the Soviet Navy and also into the shore-based naval coastal defense units. Apparently the naval authors give little consideration to the threat of an enemy landing forces on the shores of the USSR.

The naval authors consider that it is necessary for the USSR to develop some fast, small amphibious transport ships, but they point out that, to avoid wasteful expenditures in peacetime, it is advisable to have these ships under the authority of civil maritime organizations and to use them in the national economy for internal sea and river transport.

Although very little is said about the use of mines in accomplishing these tasks, mines apparently have not lost any of their former significance, and indeed a greater use may be expected.

A significant trend in coastal operations is the development of mobile bases for support activities. The exact composition of these bases is not clear, but evidence of construction of new, small naval auxiliaries, such as submarine tenders, missile support ships, and special support ships

* Admiral Kasatonov and Rear Admiral Zvyagin. [REDACTED]

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for nuclear submarines, indicates specialized support. When these ships are used in conjunction with oilers and ordinary supply ships they may constitute a small force that can move easily along the coast. Although this development may be oriented more toward the support of the seaward extension of naval operations, it is of considerable value to the accomplishment of other tasks along the Eurasian coasts.

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I. Historical Background Since World War II

Soviet strategy as a whole comprises political, economic, and military strategy, the missions of which are coordinated to serve the whole. Military strategy, although subordinate to the political and economic strategy, is nevertheless important but must be understood in terms of the aims of political and economic strategy. Moreover, naval strategy must be understood in terms of the over-all military strategy.

Simply stated, the main mission of the military has always been the strategic defense of the Soviet homeland. Because the USSR has always been a land power, it considered the ground forces, and particularly the infantry, to be the principal element of military power. Naval and air forces were designated to assist and support the ground forces in their operations.

This concept was not altered appreciably by World War II, but, with the elimination of German and Japanese military powers, the principal source of opposing power now rests on the North American continent. This fact caused the strategic missions of the military to be altered appreciably. Although Soviet strategy as a whole continued to be oriented first toward the Eurasian land mass (chiefly Europe and the Near East), the mission of the Soviet Navy was enlarged from the task of supporting ground troops in seaward flank operations to that of interdicting communication and supply lines between the US and hostile European and Asian countries.

Although the USSR emerged from World War II as a major world political and military power, the naval arm of its military power was weak. It was incumbent on Soviet leaders politically, but more important militarily, to develop a strong naval force consistent with the political position of the USSR.

It was not necessary for the USSR to develop a naval force for the purpose of protecting its overseas trade routes, because freedom of the seas for commerce already had been assured under international

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law by the navies of the Free World. However, Soviet leaders did consider it necessary to build a naval force as part of its military might.

An attempt was made during the period immediately following World War II, from late 1945 to early 1947, by several high-ranking Soviet naval officers to write on the future role of the Navy in military strategy. Probably the most pertinent of these articles was one written in 1946 by Admiral V. A. Alafuzov that outlined the mission of the Soviet Navy, observing that the fleet is called upon to fulfill the following basic missions:

1. Defense of its own sea communications;
2. Interruption of the sea communications of the enemy;
3. Defense of its territory against invasion by the enemy from the sea;
4. Invasion of the enemy's territory from the sea;
5. Defense of its shore installations;
6. Destruction of the enemy's shore installations; and
7. Support of the flanks of the army.*

These missions reflected the thoughts, which pervaded Soviet military strategy for years, that the role of the Navy was to defend the homeland against attacks from the sea. The inclusion of the mission of invading the enemy's territory from the sea may have been intended to open the way for the development of a force structure similar to that of the navies of the US and UK during World War II. Subsequent developments, however, reduced the scope of this mission to the Eurasian areas.

It became apparent in 1947 that Soviet military strategy and doctrine were being dominated by Stalin's own personal policies. The effect of this domination was to choke off most of the theoretical discussion by professional military men in the military press, of which the most important was the publication Voyennaya mysl'. This "censorship" continued until the death of Stalin in March 1953.

The Soviet concept of the naval mission that evolved during this period was essentially the same as set forth by Admiral Alafuzov, but with emphasis on "interruption of the sea communications of the enemy." This concept was to be implemented by the construction of a greatly improved surface fleet, including cruisers, destroyers, escorts, mine warfare

* Voyennaya mysl', no. 8, 1946, pp. 19-20.

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ships, and minor surface patrol boats -- all of which would operate under a broader land based air cover -- and by the construction of a huge submarine force capable of interdicting Western maritime transportation and communication lines. Early plans even envisioned the building of aircraft carriers, but this task was abandoned. Naval objectives did not include "command of the sea" beyond certain limited operational areas of the several Soviet naval fleets. These fleet areas were fixed largely by the range of land-based aircraft and by closed sea theaters.

Because Stalin apparently believed that the basic nature of war would remain unchanged in spite of the atomic bomb and that the mission of the Navy should be strictly defensive, the large naval fleet that developed under his premiership was one designed generally along the lines of World War II naval forces. The naval leader believed to be the main driving force behind this buildup was Admiral of the Fleet of the Soviet Union N. G. Kuznetsov, who, with the exception of a period from 1947 to 1951, was commander in chief of the Soviet Navy from 1939 to 1955.

In spite of the many pressing problems in economic recovery after the war, economic and political strategy was to give high priority to building a naval force. From 1948 to 1957 the USSR engaged in an unprecedented peacetime buildup of naval forces. Emphasis was placed first on the construction of cruisers and destroyers and later on submarines. The pattern of this program was not appreciably altered by the Korean War and continued several years after the death of Stalin. It is significant to note that even after the death of Stalin, his policies continued to dominate naval strategy and doctrine even to 1955. By the end of 1955 the Soviet Navy had developed to a position second only to the US Navy in the number of cruisers and destroyers and at least equal to the combined navies of the world in the number of submarines. Naval construction programs from 1948 to 1957 confirmed earlier concepts of the Soviet naval mission.

By 1955, several significant developments had taken place. The impact of the military potential of nuclear power, nuclear weapons, and missiles was being felt keenly by some military leaders. The economic recovery and the strength of the Soviet political position gave the necessary support to many military leaders to argue for a more aggressive-minded military policy.

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Although some progress had been made under Stalin in the development of missiles and nuclear power, there was little evidence that much progress had been made reshaping official Soviet military strategy and doctrine to meet the requirements of the missile/nuclear age. Although the death of Stalin in March 1953 lifted the rigid restrictions on the publication of theoretical discussions on military science and art by professional men, the influence of Stalin was felt for a number of years afterward, and recovery was slow.

In July 1953, Admiral Kuznetsov, a strong supporter of Stalinist doctrines, stated: "The experience of the Great Fatherland War alone is no longer sufficient." The significance of this statement so soon after the death of Stalin lies in its criticism of former theories for developing strategy and suggests that Kuznetsov may have been wavering in his devotion to the former Premier and his policies.

In November 1953 the editor of Voyennaya mysl', in calling attention to the changing times, stated: "The military art of the Soviet Army must take account of a whole series of new phenomena which have arisen in the postwar period."* Shortly thereafter the Soviet military press undertook a systematic effort to inform military officers of the character and potentialities of new weapons and military technology and to induce responsible officers to write on military science and art.

Several years after the death of Stalin, particularly in 1955, high Soviet military and political officials, recognizing the potentialities of nuclear power and new weapons, criticized the capability of the Soviet conventional fleet to defend the USSR adequately in a future nuclear/missile war. Although somewhat belatedly, it was realized that the large conventional fleet was rapidly becoming obsolescent. This criticism of the Soviet fleet was based not only on the lack of integration of nuclear power and missile weapons systems in its ships but also on the lack of its ability to counter the emerging threat, particularly nuclear, of the greater striking power being developed by the US Navy.

It became clear that Soviet naval strategy and policies were about to be revised drastically. The problem before the Soviet Main

* Voyennaya mysl', no. 11, Nov 53, p. 12.

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Naval Staff was one of determining the character and magnitude of the new threats of the probable enemy and the development of the required naval organization, strategy, tactics, and weapons to counter these threats.

In 1955, Admiral Kuznetsov, who did not find the same support in Bulganin or in Khrushchev that he had received earlier from Stalin, was retired for "reasons of health." The retirement of Admiral Kuznetsov probably helped clear the way for modernization of the Soviet naval forces. Admiral S. G. Gorshkov, Commander in Chief of the Black Sea Fleet, was appointed Commander in Chief of the Soviet Navy, a post he holds at the present time. Admiral Gorshkov shortly after his appointment as Commander in Chief of the Soviet Navy was given the post of First Deputy Minister of Defense. Moreover, he was elected a full member of the Central Committee of the Communist Party of the Soviet Union by the 22d Party Congress in 1961. These appointments not only reflect the ability of the man but also show continuing recognition of the growing importance of the Soviet Navy. In April 1962, Admiral Gorshkov was promoted to the rank of Admiral of the Fleet.

During the years 1955-56, Soviet naval policy and doctrine underwent a major change. Evidence of changes in programs coupled with the development of new policies have been emerging slowly both through public statements by high military and political officials and through intelligence about the development of weapon systems and the character of the shipbuilding programs.

One of the changes immediately evident which apparently resulted from a critical examination of the then current shipbuilding programs, was the phasing-out of 10 of the 11 different classes of ships under construction in 1955. Only those ships already under construction were allowed to be completed in 1956 and 1957, and only one program -- the P-6-class motor torpedo boat -- was continued through 1960. The value of cruisers to the Soviet naval fleets had been degraded somewhat earlier, and no new construction of cruisers was begun after 1954. Four and possibly six cruisers under construction at that time never were completed. Soviet expenditures on the construction of naval ships decreased sharply from the equivalent of \$1.9 billion in 1955 to about \$0.8 billion in 1957.

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Because of the growing potential of the naval role in over-all military strategy, a gradual change also took place in the attitude of high Soviet officials toward the Soviet Navy, and support was mustered to rebuild the Soviet fleet along modern lines by integrating nuclear power and missile weapons. Emphasis was placed in particular on construction of ballistic-missile-launching submarines.

Soviet military publications began emphasizing in 1955 the importance and value of submarine-launched missiles. During the Khrushchev-Bulganin visit to London in May of 1956, Khrushchev stated that guided-missile submarines are the most suitable naval weapons and that they would emphasis in future development of the Soviet Navy. Khrushchev reportedly added that possession of this weapon would give the USSR the capability of making "defensive" attacks on the US. In May 1956 the Soviet military publication Krasnaya zvezda (Red Star) contained the following statement: "Submarines having atomic propulsion and guided missiles as basic armaments can perform at great distances from their bases and secretly strike blows not only against ships but also against land targets deep in the territory of the enemy." Although this statement refers to guided missiles in the generic sense, it is believed that both ballistic types and cruise types are included. At that time, Khrushchev apparently viewed the submarine as a potential vehicle for the delivery of nuclear strikes against the American continent.

From 1955 to 1962 at least 25 new classes of naval ships, excluding auxiliaries, have been sighted. Of these new classes, 11 either are new classes or major conversions of submarines. The new classes of submarines include three different classes of nuclear submarines. In addition, one additional program (possibly two) for the construction of nuclear submarines is [] underway. The surface ships that have appeared since 1955 include 4 classes of destroyers, 3 classes of minesweepers and 7 or 8 classes of fast patrol boats or antisubmarine ships.

In 1957, new ships of improved designs began to appear, including the first newly-constructed ballistic-missile-launching submarine. In 1958 the first Soviet nuclear-powered fleet-attack submarine appeared. Although the first ballistic-missile submarine to be completed was powered by diesel battery, the first nuclear-powered version appeared

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in 1959. In 1960 the first newly constructed nuclear-powered submarine armed with cruise missiles appeared. Surface-to-surface cruise missiles appeared on a Kildin-class destroyer* in 1958, and in 1959 the new Krupnyy-class guided-missile destroyer* equipped with two surface-to-surface cruise missile launchers appeared. This was the first destroyer among the navies of the world to have its main armament consist entirely of missiles. In mid-1962 the new Kynda-class guided-missile destroyer* appeared. This destroyer is equipped with an improved surface-to-surface cruise missile and is the first Soviet destroyer to be equipped with both SAM's and SSM's. In 1959 the first vessels of the Osa-class* (a new class of large patrol boat) appeared in Leningrad, and in 1960 the first Komar-class boats* (modified P-6 class motor torpedo boats) appeared with launchers for short-range SSM's.

Since 1957, with the exception of the construction programs for some minor surface ships, the average number of naval ships produced by the USSR has been considerably smaller than the number produced during 1948-57. Average annual expenditures for the construction of Soviet naval ships, which were equivalent to about \$1.5 billion during 1950-55, fell to about \$1.2 billion during 1957-62.

The changes that took place in the ship production program reflect serious attempts to improve the Soviet naval fleets qualitatively, and new ships that have appeared since 1957 represent considerable advances for the USSR. Because of technological improvements that are being made constantly in ship propulsion systems, missile weapons, and electronics, it is entirely possible that the USSR will not choose to mass-produce any single design in the near future on a scale comparable to the construction programs of the Kuznetsov period. Moreover, as these new developments become operational, a greater diversification in the types of naval weapons may be expected. Also, the composition of the naval fleets may continue to change.

The prestige of the Soviet Navy has continued to rise in both military and political circles. Since 1957, developments of ships and weapons and statements by responsible political and military, particularly naval,

* See Appendix C.

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leaders have given some indication of current and probable future naval strategy, policies, and trends.

In subsequent sections of this report an attempt is made to assess the current Soviet naval strategy, mission, tasks, and, to a lesser extent, doctrine and to present an appreciation of Soviet views about the forces and aims of NATO.

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II. Soviet Writings and Discussions of Naval Strategy, 1959 to the Present*

From 1953 to the end of 1959, the Soviet military debate was centered largely around the effect on the military of the rapidly advancing weapons

* The recent Soviet publication Military Strategy, edited by Marshall of the Soviet Union V. D. Sokolovskiy and published in Moscow in 1962, was reviewed for pertinent information on naval strategy. The publication offered little in this respect. The fact that no naval officer was included in the committee of authors may contribute to this deficiency. References to naval operations and capabilities are rather sketchy, poorly related with respect to priority of tasks, and in many cases incorrectly stated. A good critique of this publication on the improper and incorrect manner in which naval matters were handled was written by Admiral V. A. Alafuzov in Morskoy sbornik, No. 1, Moscow, January 1963, pages 88 through 96. For example, the publication Military Strategy stated:

Much has been said in the foreign press about nuclear submarines, armed with Polaris missiles. The assertion has been made that these are the most invulnerable means for the use of missiles. Actually, these weapons are vulnerable. Homing missiles launched by submarines and surface ships are an effective weapon against missile-carrying nuclear submarines.

Commenting on this passage, Admiral Alafuzov wrote:

Moreover, in another place in the chapter, speaking of the struggle against missile-carrying submarines, the authors overvalue the potentialities of missiles. For example, on page 340, they state categorically without providing grounds therefore, that atomic missile-carrying submarines are actually vulnerable and that "self-guiding missiles of submarines and surface [continued on p. 32]"

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technology. During the early part of this period the main emphasis was on how to adapt the new weapons to traditional concepts, and then later, as more and better weapons became available, it became necessary to modify traditional concepts to suit contemporary trends in military science and art. During the latter part of this period, when the potential of long-range ballistic missiles was being realized, opinions began to be expressed by some Soviet political and military leaders on mass destruction and increasing reliance on this weapon system. Much of this trend was opposed by the more conservative, or "traditionalists," elements of the military. Khrushchev, viewing the potential of this new weapons system as a means of providing greater security for the USSR, outlined in his report to the Supreme Soviet in January 1960 a new military policy. The essence of his plan was to place main reliance on nuclear-missile forces, to reduce military manpower substantially, and to accelerate the retirement of older weapons. This plan, he asserted, was the force structure best suited both to deter war and to fight one if necessary. Moreover, among other armed forces, surface naval forces would soon become obsolete. Khrushchev's speech probably was drawn up after consideration of this policy in December 1959 by the Central Committee of the Communist Party.

Although Malinovskiy generally supported Khrushchev in a speech to the same meeting of the Supreme Soviet a little later in the month, Malinovskiy warned against overreliance on nuclear-missile forces and expressed the opinion that a successful conclusion of a war would depend on the use of all types of armed forces.

Malinovskiy, in his speech before the 22d Party Congress in November 1961, stressed even more the need for joint action by all forces and the requirement for mass armies and stated that the most important task of the armed forces was to be "in constant readiness

vessels" are an effective counter-measure to them. Such an unproved conclusion is very bold and unconvincing. I think that consideration was not given to the indisputable fact that atomic submarines will operate only submerged.

It was believed that Military Strategy makes only minor contribution on the question of Soviet naval strategy. Therefore, no use of this publication was made in this report.

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to repel an attack by the enemy" and to be capable of "breaking up the aggressive designs [of the enemy] and dealing him a crushing blow in time." Khrushchev modified his position considerably between January 1960 and November 1961, moving away to some extent from a one-sided policy and yielding to a position more favored by the military in general.

Late in 1959 the Soviet leadership, apparently motivated by the critical necessity for reviewing current (1959) military strategy in the light of weapons development, intensified the drive for creative military thought and instituted "a military-theoretical conference by correspondence." One forum was the open military publications; the "widest circle" of Soviet officers was enjoined to participate in promoting the advancement of Soviet military concepts. In addition, a classified forum was set up for relatively free-ranging discussions of military problems.

With a view to activating theoretical discussion of the most important and pressing problems of "Soviet military science, and above all of military art," Malinovskiy authorized the publication of a TOP SECRET Special Collection series; in addition to the currently published SECRET version of the top Soviet military journal Voyennaya mysl'. * Distribution of the Special Collection would be restricted to a limited circle of officials, from army commander upward according to a special list. Leading personnel of the armed forces, the troops, the military academies, the chief and central directorates, and the general staff, who could contribute most to the development of Soviet military theory in the light of the requirements of modern warfare, were invited to write articles for this Special Collection.

The editor of Voyennaya mysl', General-Leytenant N. A. Radetskiy, in the preface to the first issue of the Special Collection, issued in early 1960, outlined the scope of the problems to be considered in these articles. Among other items for consideration, the editor stated:

"The most urgent task of our military-theoretical thought is to overcome certain antiquated views, and to scrutinize boldly, on the basis of a feeling for new development, the changes taking place in military affairs. Such an approach

* For a brief description of the periodical, see Appendix A.

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will assure the clear understanding of realistic courses of the further development of Soviet military science, and vigorous, creative elaboration of pressing, new problems of military art as regards strategy, operational art, and tactics, as well as problems regarding the structure and organization of the Armed Forces and of the development of military equipment.*

The editor further stated: "Depending on the elaboration and clarity of the various matters discussed, there will be published conclusive articles which we propose to invite the most competent individuals collectives of creative authors, and, when necessary, official organs to write." There is at present no information on the status of preparation or publication of these conclusive articles. The response to the initial invitation to write on military science and art has resulted in the publication, available as of the date of this report, 12 articles by 10 naval authors that deal solely with naval matters. These articles cover a time period from early 1960 through mid-1962.**

The editor of Voyennaya mysl' stated: "These articles ... are published as a discussion and express only the opinion of the authors on the subjects which are broached." It is believed that these articles are authentic, and, in the case of articles dealing with naval matters, that they represent the views and arguments of important Soviet naval officers.

The biographic data available on these authors show that all are senior naval officers. Only one, however, Admiral Kasatonov, Commander in Chief of the Northern Fleet, is known to have held an active operational command at the time he wrote for the Special Collection. Although one of the authors is identified as head of a naval war college, and another as on the editorial board of the important military publication Morskiy sbornik, others are either in unidentified posts or retired.

* For complete remarks by the editor of Voyennaya mysl', see "Establishment of the TOP SECRET Special Collection of Articles of the Journal 'Military Thought (Voyennaya mysl'): by the Ministry of Defense."

** These articles, arranged in chronological order, as they appeared in special issues of the Special Collection, are listed in Appendix E.

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Up to mid-1962, no article was published by an officer of lower rank than a captain first rank by which a comparison could be made with the thoughts of younger officers.

The Soviet naval authors who wrote for the Special Collection seem to view a future war as one of some duration. Admiral Platonov* stated early in 1961 what seems to be a view shared by most naval authors regarding length of future war and the involvement of naval forces:

If we proceed from the fact that a modern war will not be a blitzkrieg, but will be lengthy in nature, we unavoidably come to the conclusion that there will be a wider scale of combat operations by naval forces. It is necessary to assume that the known forms of combat at sea will undergo changes, and that new methods of naval operational art and tactics will be introduced, while accomplishing both the old and the completely new missions of the Navy. 5, p. 2/**

Here Platonov supports the argument for growth rather than reductions of naval forces.

The Soviet naval authors seem to support generally the military position taken by Makinovskiy rather than the military policy outlined by Khrushchev in January 1960. For example, Colonel-General A. Gastilovich, a proponent of massive use of nuclear-missile weapons, in the first issue of the Special Collection early in 1960 stated, in reference to the destruction of enemy amphibious forces:

Enemy amphibious landing operations, while enroute at sea, do not merit expensive and cumbersome operations

* Admiral Platonov at the time that he wrote for the Special Collection was believed to be serving in an unidentified staff position with the Main Naval Staff in Moscow. Platonov is an experienced operational officer, having held the post of Commander in Chief of the Northern Fleet. Other naval authors writing for the Special Collection criticize Platonov's views more than those of any other single naval author.

** Source references refer to the bibliography in Appendix E and are numbered to agree with the corresponding source number in the bibliography. Following the numerical reference is the page reference of the cited document.

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against them by the Navy and Long Range Aviation. The basis of their annihilation can be missile-strikes in embarkation and debarkation areas; while en route at sea, it is again more expedient to annihilate landing forces by strikes with missiles having nuclear charges of several megatons. After the discovery of the landing forces at sea, these attacks can be calculated on the basis of their passage of a definite point [area]. *

Rear Admiral Lisytin** commenting on Gastilovich's proposals pointed out that circumstances militate against accomplishing the mission in the manner proposed and also warned against denying territory to the USSR because of atomic radiation as follows:

Moreover, another fundamentally important circumstance is involved. Would it be right to transfer the zone of nuclear combat to our territory? We believe not. The course of turning one's territory into a desolate wilderness can obviously be followed only in certain directions, and then only in the most exceptional cases. 4, p. 13/

Platonov went on to point out the necessity for maintaining large land and sea forces to conclude a war effectively as follows:

Inasmuch as aggression in a modern war is likely to be from beyond the sea or ocean, it is only possible to reach its nest for the final blow by means of a naval landing operation. It is natural to assume that such a landing must be composed of several armies, that thousands of ships and naval vessels will be needed for its landing, supply, and reinforcement, and that it will be necessary to precede the operation itself by successful operations to achieve air and sea superiority. But

* "The Theory of Military Art Needs Review," by Colonel-General A. Gastilovich, Voyennaya mysl', first issue, Special Collection, 1960, pp. 15-16.

** Rear Admiral Lisytin at the time that he wrote for the Special Collection was believed to be a member of the faculty of the Order of Lenin (formerly Voroshilov) Naval War College. Little is known of his earlier life.

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it is certainly necessary to prepare for such an operation, the more so because recently we have completely, and without reason, lost interest in the debarking of landing forces. 5, p. 11/

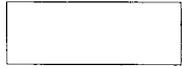
An over-all impression gained from the articles by the naval authors is that the mission of the Soviet Navy in grand military strategy has been formulated and coordinated by the Supreme High Command. This is not to say that some parts of the mission will not be expanded with advances of weapons technology, but it is believed that the basic concepts will hold for the next 10 to 15 years. The mission, therefore, apparently has not been considered a subject for debate. The vigorous and critical debate among the naval authors is confined largely to the basic strategy or, in the Soviet term, to "operational art." The arguments include some criticism of the organizational structure and management of scientific-technical research and military-economic studies, but the major part is devoted to theories for developing strategy, tactics, and forces to accomplish the specified tasks of the Navy. The naval authors do not always agree on the strategy for accomplishing a specific task. Although some rebuttal statements are interspersed in the articles, there are two articles largely devoted to rebuttal arguments.

The naval authors have complied consistently with the request that the discussions be theoretical. This fact is further emphasized by the omission, except in a very few instances, of identification by name or project number of any naval weapon or weapons presently in the fleet or under research and development. The authors also were requested to "propose realistic solutions." Implicitly imposed on the authors was the responsibility to consider forces that were technically achievable by Soviet industry. Most of the authors adhered to this premise; however, some proposals, although conceded to be scientifically possible, may not be technically achievable within the foreseeable future. Because the "solutions" embody both strategy and means and because the authors do not always agree on the solution for accomplishing a specific task, it is difficult at times to judge specifically which concept is most likely to govern. Nevertheless, it generally has been possible to identify the main trends in current naval strategy as well as the issues that still have to be settled.

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III. Broad Aspects of the Current Mission of the Soviet Navy

The basic mission of the Soviet Navy has been enlarged since the mid-1950's to include the strategic defense of the USSR against attacks from the sea by strategic attack carrier groups and Polaris submarines and to engage in missile attacks against foreign territory. The Soviet Navy still retains the more traditional roles of the basic mission such as interdicting the sealines of communication of the enemy, defending the littoral of the USSR, and providing support for the seaward flanks of the ground field forces. The current development of naval forces indicates that the USSR is placing great emphasis on the development of naval forces to accomplish the current mission.

The basic principles of this mission apparently are accepted by Soviet naval officers. This acceptance is supported further by the articles in the Special Collection, the current force structure of the Soviet Navy, ship construction programs, and other intelligence. Moreover, there is little evidence of arguments in the Special Collection for changing the broad concepts of this military mission. The mission as conceived immediately after World War II envisioned the development of naval forces capable of denying the enemy access by water to the shores of the USSR and to the shores of land adjacent to the USSR through which the enemy might threaten the Soviet homeland. The introduction of nuclear power and missiles into the family of weapons of NATO's sea-borne forces not only changed the character of the sea-borne threat against the USSR but also caused a rapid change in the character of the Soviet naval defense.

The huge NATO naval force, ranging from landing ships to the strategic attack carriers and Polaris submarines together with an enormous merchant marine, presents a formidable sea-borne force arrayed against the Sino-Soviet Bloc. Because this is a mobile force, it cannot, at present, be a target for the Soviet Strategic Rocket Forces. The task of destroying NATO's sea-borne forces is therefore assigned to the Soviet Navy.

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Because there is no evidence supporting the existence of a Soviet plan for waging ground warfare on the North American Continent, the scope of the mission of the Soviet Navy does not provide for naval forces, principally surface groups, superior or even comparable to the navies of NATO, whereby the military force of the USSR may be moved over the oceans in face of the opposing naval forces of NATO. Although the mission of the Soviet Navy may be viewed within a concept for the development of general-purpose naval forces, there is no evidence that the USSR will develop naval forces to protect sealines of communications in time of war to remote areas such as Cuba, Laos, and Africa. Neither the structure of the Soviet naval force since World War II nor indications in available intelligence suggest that a Soviet attempt at "supremacy at sea" would be applied to sea areas beyond the limited geographical defense zones assigned to each of the four major Soviet fleet commands or as may be required to give local theatre support to ground troops in aggressive action on the Eurasian continent.

At present, Soviet naval forces are divided among four geographically oriented fleet commands, and all naval operations are conducted solely from bases and controlled from communication centers located in the USSR. The fleets in Black and Baltic Seas operate in a "closed sea theater," the access to which from open seas is through narrow straits held by potential enemies of the USSR. Because these seas open important economic sectors of the USSR to approach by water, considerable attention is given to their local defense. The Northern and Pacific Fleets, however, have access to open seas through Soviet-controlled waters. It will be largely through these fleet areas that Soviet barrier patrol and long-range operations against NATO's forces will be conducted. The effective range of Soviet surface ships is limited to the operational radius of Soviet land-based naval aircraft. When operating beyond Soviet barrier patrols and the effective limits of the surface navy, submarines with long-range ballistic missiles, cruise missiles, and torpedoes -- deployed principally in the Northern and Pacific Fleet areas -- will have as their principal wartime tasks the interdiction of the enemy's seaborne nuclear strike forces, the destruction of specific land targets (particularly those supporting seaborne forces), and the interdiction of supply and communication lines.

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Even though each of the four Soviet fleets has a force consisting of submarines; reconnaissance and medium bomber aircraft; coastal defense units (SAM's and SSM's); and surface ships of cruiser, destroyer, escort, patrol, and mine warfare types, Soviet naval officers seem to consider these forces to fall far short of those required to accomplish their assigned tasks successfully, particularly in ocean areas beyond the local sea theatres.

A. Naval Thinking on Strategy of Surprise and Preemption

US development and deployment of nuclear weapon delivery systems that can strike deep in the Soviet homeland, such as long-range jet bombers of the Strategic Air Command, strategic attack carrier groups, Polaris submarines, and land based ICBM's and IRBM's, have contributed to an apparently genuine fear among some high-ranking military officials of a first or even a surprise attack by NATO's forces. Current Soviet military thought seems to regard surprise to be of utmost importance, but not necessarily conclusive.

Soviet naval officers tend to assume that a future general war will not be concluded by an initial nuclear strike by either side, even of a surprise or preemptive type. Admiral Platonov wrote: "If we proceed from the fact that a modern war will not be a blitzkrieg, but will be lengthy in nature, we unavoidably come to the conclusion that there will be a wider scale of combat operation by naval forces." 5, p. 2/

Soviet naval authors seem well attuned to the tenor of current Soviet discussions of over-all nuclear strategy and accordingly argue the adoption of preemption as a strategy and urge the development of naval forces sufficient to "frustrate" an attempted attack upon the USSR by NATO's naval forces, in particular attack carrier groups and Polaris submarines. The authors discuss and seem agreed on the growing importance of being able to find and counter enemy naval forces on a timely basis far from Soviet territory or water. At the same time they seem well aware of current limitations, and they collectively offer a wide variety of conceivable solutions.

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Admiral Kharlamov,* in December 1961 stated:

It is a universally recognized principle that the initial period of a war will have a decisive influence on the subsequent operations of each of the opposing sides. Obviously it is during this very period that both of the opponents will strive to use the greatest possible part of their nuclear/missile power amassed during the many years of peace. Here, from the very beginning of the war, a fierce struggle will be carried on to ensure the opportunity to use to the full the most powerful means of destruction available, or, as we say, the struggle for the strategic initiative.

The main point of this struggle for our armed forces will be to frustrate the enemy attack, deny him the opportunity of carrying out previously developed plans for the initial operations, and from using means of mass destruction readied in advance, and at the same time, to deliver such a powerful strike against the enemy that it would appreciably reduce his capability to conduct subsequent combat operations. 10, pp. 2, 3/

In October 1960, Admiral Tributs** called attention to the probability of a sudden strike by NATO forces and the characteristics of threats leading to an initial strike. He indicated a strong belief that the USSR would have strategic warning even of a sudden attack by NATO aircraft

* Admiral Kharlamov at the time that he wrote for the Special Collection held a high staff position with the Main Naval Staff in Moscow. He is an experienced operational officer having held the post of Commander in Chief of the Baltic. His professional interests are primarily in the staff and ministerial aspects of naval affairs.

** Admiral Tributs at the time that he wrote for the Special Collection apparently was retired from active career but was serving as a member of the editorial board of Morskoy sbornik. Tributs is an experienced operational officer having held the posts of Commander in Chief of both the Baltic and Pacific Fleets.

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carrier and Polaris forces and affirmed the importance of developing means to "frustrate" such an attack:

We must bear in mind that in a future war, we will have to deal with an enemy with a strong Navy, who places great significance on ocean and sea axes with the goal of preparation for and execution of sudden attack by aircraft carrier and missile carrier forces. Among the modern military problems, one of the most important . . . places undoubtedly belongs to the problems of the situation of threat and the initial period of war It is impossible, therefore, to agree with those authors who assert that under modern conditions war can begin suddenly and that the situation of threat will not occur at all. Such assertions are potentially false. The situation of threat will always occur but its characteristic indicators and duration may be extremely diverse. Specifically, there may also be a variant of the situation of threat when its duration will be very, very short These indicators will enable one to proclaim in advance the period of threat, accomplish the necessary measures for the final completion of preparation for war, bring to complete combat readiness all forces and means for the delivery of immediate and crushing strikes on the aggressor, and also for the organization of defense, protection, and speedy elimination of the consequences of the first strikes. 3, pp. 3, 4, 9/

Tributs further pointed out:

The threat situation may be characterized by such a status of international relations that as a result of a sharp aggravation of contradictions between the states of the Anglo-American imperialist coalition and countries of the Socialist Camp, the threat of the immediate outbreak of war will become so real that it will be necessary to reorganize the armed forces, the economy, and

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the entire life of the country quickly in accordance with wartime demands Specific signs of the rise of the situation of threat comprise a complicated number of socio-political, economic, mobilizational, and military measures being executed by the probable enemy with the goal of the immediate unleashing of a war. Not only the birth, but also the nature, of the situation of threat may depend on these measures One of the most important indicators of the situation of threat may be measures of the enemy in preparing his naval forces for specific operations; changing the areas and nature of operational and daily combat training of aircraft carrier large units and missile-carrying submarines, movements of aircraft carriers under the guise of training cruises, training exercises, or movements to bases and ports of states contiguous to us, the appearance of aircraft carriers and missile-carrying submarines in zones of ocean and sea theaters of military operations from which they can utilize missile weapons and carrier aircraft against our coast and rear areas of the country It is necessary to bear in mind that the basic measures executed by the enemy with the aim of preparing for the immediate unleashing of a war will be carefully concealed and conducted with great secrecy.

In view of this, the activity of our intelligence, which in the threatening period must be activated to the maximum extent, gains paramount importance. It must uncover the nature of the enemy's preparations to begin a war and make it possible for us to frustrate all attempts for a sudden attack on our Homeland.

The top-priority mission in the initial period of a war must be the frustration of a sudden attack by the

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enemy and the infliction on him of immediate and crushing strikes with the use of all the latest means of destruction. 3, pp. 4, 5, 6, 8/*

Within the scope of the apparent current mission, which seems to be oriented largely toward countering the enemy's seaborne threat, there was little evidence in the past of the development of a capability in the Soviet Navy to initiate or participate in a surprise or even a first strategic strike attack against the West. Because of the fear of a surprise attack by NATO's forces, however, serious consideration apparently is being given to a development and deployment of forces capable of contributing to a preemptive strike against NATO's naval forces.**

The strategy of preemption appears consistent with the current mission of the Soviet Navy in that the Navy views its role as one of preventing or blunting an attack on the USSR from the sea. The task of strategic strike in the initial period of the war seems inconsistent with the naval forces in being because of the relative short range of operational submarine-launched missiles and that a large part of the missile submarine force is diesel-propelled. However, in view of recent developments which indicate the probable creation of a strategic strike capability in nuclear submarines, the current mission of the Soviet Navy may be expanded to supplement the mission of the Strategic Rocket Forces.***

Development of Soviet naval forces designed to be in a position to attempt to frustrate an attack at any time would require the construction of a force consisting principally of nuclear-powered submarines equipped to fire antiship cruise missiles and torpedoes armed with nuclear warheads and an ASW force consisting of both submarines and surface ships -- including merchant and fishing ships -- all of which

* For an earlier and significant reference to "surprise" and "preemption;" see the article entitled "On the Role of Surprise in Contemporary War" by Marshal of the Tank Troops Rotmistrov, Voyennaya mysl', March 1955.

** Such consideration is particularly notable in the discussion about developing forces to counter NATO's attack carrier groups and Polaris submarines.

*** For a discussion of the development of a strategic strike capability, see VII, p. 151, below.

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would be augmented by reconnaissance, ASW, and missile-carrying aircraft. Furthermore, these forces would have to be deployed in peacetime within striking range of the take-off line of aircraft from NATO's carrier task forces and the launch areas of Polaris submarines. The construction of such a force and the continual deployment would achieve two Soviet objectives: (1) having a force at sea in a continual state of combat readiness so that whenever threat by NATO forces is considered to be so clear as to indicate the inevitability of a strike against the USSR, Soviet naval forces could initiate a preemptive blow to these NATO forces, and (2) having a mobile nuclear strike force continually at sea and away from fixed bases, thereby achieving antinuclear dispersal in case of a NATO surprise strike.

B. Expansion of Submarine Warfare

The continued emphasis on the development and construction of submarines, particularly those with nuclear power, and of both cruise and ballistic missiles to be fired from submarines suggests that long-term Soviet naval policy will shift from the long-held policy of defending only the Soviet homeland in Eurasian (particularly European) littoral waters, to a policy of attempting to counter the "aggressor" in waters and bases far from Soviet shores, even to the shores of the US.

Admiral Kharlamov, in December 1961, wrote an article that in part replied to criticism made earlier in 1961 by Admiral Platonov of operational exercises of the Soviet Navy. In this article, Admiral Kharlamov pointed up the seaward extension of operations of the Soviet Naval Forces in a Pacific Fleet exercise in October 1959 as follows:

This Pacific Fleet exercise was one of the first major exercises in which the operations of our forces were carried out at a great distance from their bases, that is, in those areas where enemy naval forces may be engaged in operations in a future war. The forces representing the simulated enemy carrier attack force were deployed through the Korean Strait and proceeded to the east of Japan, to a distance of a few hundred miles. For operations against them, the submarine

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forces of the Pacific Fleet were deployed southeast of the island of Hokkaido. Aviation from the area of Sovetskaya Gavan delivered strikes against war ships at sea. Thus, in this exercise, simulation of the operations of forces was brought to a minimum.

During the exercise, only one version of the operations was played, and the most difficult one at that -- when the carrier attack force is deployed within the operational area of aviation from remote bases, located in the Hawaiian Islands. In this version our Navy will have less time for organizing a strike. Organization of reconnaissance and target designation will be particularly difficult in such a case. 10, p. 10/

As is generally known, our Navy broke away from the shore just a few years ago, and the main areas of its combat training became those seas and ocean regions which would most likely be used by the naval forces of the enemy in a future war. These areas are quite distant from our bases, airfields and coastline, and this fact in itself brings the conditions under which our naval forces will operate nearer to actual wartime conditions. In these areas submarines and missile-carrying aviation develop and check out in practice the most effective methods of operations and the use of their weapons in a complex situation.

At the exercises, in accordance with the particular situation, submarines are deployed in appropriate groupings in the most probable areas of operations of enemy carrier strike forces. In order to simulate the operations of the "enemy", warships usually go out to sea and carry out operations in accordance with the views of the military leadership of the NATO countries which are known to us. 10, p. 13/

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Here Admiral Kharlamov undoubtedly was referring to the exercise in the Western Pacific that he mentioned earlier and probably includes exercises that have been held for several years in the Norwegian Sea and the Greenland-Iceland-United Kingdom area of the North Atlantic.* Admiral Kharlamov makes several significant statements in the article quoted above when he refers to Soviet naval exercises being carried out "at a great distance from their bases" and stated, "our Navy broke away from the shore just a few years ago." These statements clarify to a great extent references by other Soviet naval authors when they refer to operations at great distances from the shores of the USSR. One Admiral refers to a "near zone" and "far zone" -- the extreme limit of the far zone being the far edge of the area where Polaris submarines might launch their missiles. The area beyond the far zone is referred to as the remote area of the oceans. For the past several years, the USSR has made a concerted effort to extend fishing operations to waters far from Soviet shores and to engage in world commerce with nations situated far from the USSR. The extensive hydrographic surveys that have been conducted in the principal waters of the world point up Soviet attempts to collect technical data, to train mariners, and to develop a feel for long-range operations. The transfer of some naval surface ships from the Black Sea to the Pacific Fleet by way of the Suez Canal and Indian Ocean and the transfer of some submarines from west to east by way of the South Atlantic and Indian Ocean also have provided some training and feel for long-range operations. Because the Soviet naval force has been a "coastal" force, the idea of becoming a global force, which at present is being considered only for submarine operation, presents many problems; not the least of which is overcoming the traditional concept of a littoral Navy. Admiral Kharlamov, in discussing combat with US missile submarines, states:

It is felt that combat with missile submarines is to be carried out with equal intensity in both close and

* Major Soviet fleet exercises over the past several years have been viewed by Western analysts as defensive operations against NATO's naval strike forces. Tactically, submarines have been deployed into barriers with surface elements backing up barriers. Air support components have operated in both support and independent roles.

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remote areas. It will consist of strikes against missile submarine bases, the mining of their basing points, and destroying them in remote areas, prior to their approach to firing positions. 10, p. 19/

He implied that operations will be carried out even farther from the USSR than the exercise areas mentioned above.

In extending the area of combat operations, Rear Admiral Zhukovskiy* proposed what may be interpreted as using nonnaval ships and aircraft for purposes of early warning in preparing for combat with enemy submarines as follows:

It is advisable to carry out combat operations to destroy enemy submarines at sea, particularly in the initial period of war, by enlisting the maximum possible quantity of antisubmarine forces and facilities of the fleet and also the ships and aviation of the maritime fleet, the fishing industry, and the Chief Directorate of the Northern Sea Route, which are capable of carrying out observation of enemy submarines. In the period preceding the initiation of combat operations, all of the forces mentioned should be deployed in the zone covered by the system of antisubmarine defense in the theater, beyond the limits of this zone on the approaches to the points of basing of the submarines of the probable enemy, and on the routes of their movement into areas of combat operations. 9, p. 14/

Admiral Panteleyev,** writing in mid-1961, defined future submarine operations as being conducted in the depths of the ocean or sea

* Rear Admiral Zhukovskiy's position at the time that he wrote for the Special Collection is unknown. He has held operational commands in the past, and it is believed that part of his career has been associated with matters of naval intelligence and security.

** Admiral Panteleyev at the time that he wrote for the Special Collection was believed to be the commanding officer of the Naval War College for Shipbuilding and Armaments imeni [footnote continued on p. 50]

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without the necessity of rising to the surface and proposes to extend the strategy of submarine warfare to include an autonomous underseas fleet, as follows:

It appears to us that it is now essential to create separate submarine forces capable of independently resolving tactical or operational missions. We have in mind submarine squadrons of vessels with atomic propulsion. Such a squadron must consist of strike submarines (with missiles and torpedoes), reconnaissance submarines with powerful hydroacoustical equipment, antisubmarine defense submarines, minelaying submarines, and supply submarines. Upon receiving its combat mission for operations in prescribed area of the ocean or sea, the submarine squadron, independently, with its own submarine reconnaissance forces, must find the assigned target and direct its strike forces against it. On the basis of his intelligence data, the commander of the operation must plan the main direction of the strike and determine the forces to be used against the main target, the operational makeup of these forces, and the forces to be used in a strike along the auxiliary axis. In a number of instances the covert laying of mines (anchored or floating) may delay enemy deployment and in this manner support the operations of the strike submarine forces. It is doubtful that the existing hydroacoustical equipment of the enemy will be able to determine accurately the entire depth of the operational makeup of the submarine forces and the large number of attacking submarines deployed at various depths. In any event, the ranges of this equipment are still much less than the ranges of our modern long-range torpedoes, let alone missiles.

A. N. Krylov. In the past, he has held high staff positions, such as Commanding Officer of the Order of Lenin Naval War College and Commander in Chief of the Pacific Fleet.

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It is evident that an ocean-going atomic submarine, carrying powerful nuclear armaments, must have its own reliable defense under water from enemy submarines (anti-submarine defense) and from mines (while moving at corresponding depths), in order that the submarine commander can devote all his attention to the major task -- the attack of the assigned target. With the development of the means of underwater television, sonar, and communications, the control of a submarine squadron becomes possible and submarine battles and engagements with all their underwater aspects -- reconnaissance, deployment, strikes against protective forces, and against the main target -- assume realistic forms. 7, p. 8/

The adoption of such tasks on a large scale would require intensive construction of nuclear submarines and training programs over a period of 15 or more years.

The naval authors base their theoretical strategy for expanding submarine warfare on the performance capabilities of nuclear submarines. They consider diesel submarines as being too limited in performance capability to engage either attack carrier groups of Polaris submarines effectively in combat, particularly in areas beyond the local sea theaters. The continuation of the present construction of diesel submarines in the USSR, however, seems to indicate that the full implementation of this policy is not feasible even at this time.

C. Trends in Soviet Construction of Submarines

Apparently, Soviet naval leaders realized in 1954 that combat with NATO's attack carrier groups and nuclear submarines and the interdiction of supply and communication lines required submarines of greater range and combat capabilities than those available in the large fleet of diesel-powered submarines (mostly W class and a few Z class). During the period 1954-56 the design was begun on two classes of improved long-range diesel submarines and three classes of nuclear-powered

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submarines. The production of these five classes has continued through 1962.*

The continuation of the construction of diesel-powered submarines to the present time may be attributed to a combination of factors. Soviet naval leaders, having in mind the future extension of the range of Polaris missiles, apparently feel an even greater need now for additional numbers of long-range submarines deployed farther from the shores of the USSR. This deployment can be accomplished to a significant extent even with the use of improved longer range diesel-powered submarines. The current Soviet rate of production of nuclear submarines would not provide the numbers that the Soviet naval leaders believe to be required within the time limit they believe necessary to offset the threat from Polaris submarines and attack carrier groups when it reaches its maximum about 1967.

The USSR has not shifted completely to production of only nuclear submarines as did the US in 1956.** Since 1960 the USSR has completed about 40 diesel-powered submarines. The rate of construction of nuclear submarine over the past 3 years has been rather steady at seven or eight units per year. This rate may reflect the maximum economical annual capacity of developed facilities for production of critical components for nuclear submarines. The shipyards that currently are building nuclear submarines also are participating in the production programs for diesel submarines. These shipyards have a combined capacity to produce at least twice the number of nuclear submarines that currently is being produced. It is believed, therefore, that any significant increase in production probably would first result from the allocation of additional economic resources for expanded critical component production facilities, but there is no evidence of such expansion at present.

* Of particular interest is the rate of production of the nuclear-powered submarines: one in 1958, four in 1959, seven in 1960, seven in 1961, and eight in 1962.

** The last construction contract for building a diesel submarine in the US was awarded in mid-1956.

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Evidence indicates that some nuclear submarines have experienced failures in their propulsion systems. However, the annual rate of production of nuclear submarines has not suffered a sharp decline as would be expected if exceedingly major difficulties were being encountered. Rather, it appears that these problems are of the nature that imposes an additional load of production facilities for the special components of nuclear submarines through the necessity of more frequent repairs and replacement of parts. In view of the apparent urgency of the nuclear submarine program, indicated not only by the authors of the Special Collection but also in other intelligence, it is expected that the rate of production will increase in the future through the resolution of technical difficulties and through capital investment in additional facilities for the production of components.

D. Development of a Submarine Strategic Strike Force

Significantly the Special Collection contains very little discussion of or arguments for the development of a strategic strike force of ballistic-missile submarines similar to the US Polaris submarines. The absence of arguments, even for the development of such a force as a deterrent (which here may be considered of greater political than military significance), may be explained in one or more of the following ways:

1. The task itself apparently was not assigned currently to the forces of the Soviet Navy, perhaps, because of the inadequacy of the types of submarine missile systems operational at the time. Planatov implied that officially accepted military policy sometime before May 1961 excluded ballistic-missile-launching submarines from the mission of long-range strategic strike as follows:

Not long ago our submarines, armed with ballistic missiles, participated in strikes by missile troops of strategic designation against deep enemy objectives. Now, with the appearance in our armament of intercontinental ballistic missiles which can reach any point on earth, missile submarines have been freed from these missions. It seems to us that such a step is premature. 5, p. 11/

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2. The task, although assigned to naval forces, is not under the exclusive command of the Soviet Navy; therefore, there is no need for developing strategic planning for naval commanders.

3. A tacit understanding among Soviet naval officers that accomplishment of this task is not a subject for discussion in the naval debate about the means by which the tasks of the Navy would be accomplished or that such discussions were so sensitive that they were being carried on under even greater security restrictions;

4. Top Soviet leadership believe that the IRBM and ICBM programs would be adequate for purposes of total strategic strike. This last possibility, however, seems to be contradicted by evidence of developments both in the land-based programs and developments in the Soviet Northern Fleet in 1962 and early 1963.

The USSR is well aware of both the political and military potential of the US Polaris program. The magnitude of the threat of this force to the security of the USSR is fully recognized. A measure of the seriousness with which the USSR views this threat can be seen in the priority given to the development of a force to counter the Polaris submarines.

In spite of the omission in the Special Collection of consideration of a proposal for developing a strategic strike force of long-range ballistic missiles launched from submarines, high-level support is being given to accelerated research and development to significantly improve the strike capability of ballistic-missile submarines. Intelligence indicates that since early in 1962 the USSR has conducted a number of test firings in the Northern Fleet area of a new ballistic missile that for the first time is fired from a totally submerged submarine. The range of this new missile is far in excess of the 350 nm (SS-N-4) type of ballistic missile presently operational in some Soviet submarines. The estimated range of the new missile is about 650 nm. It is entirely possible that the testing program underway in the Northern Fleet area may lead to two significant developments: (a) improvement of the current capability of the Soviet Navy for firing ballistic missiles having a range of 350 nm from surfaced submarines to a capability for firing to a range of at least 650 nm from totally submerged submarines and (b) the development

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of the capability for a long-range (possibly as much as 1,800 nm) strategic strike. The exhibition in the Moscow parade of 7 November 1962, and more recently in the parade of 1 May 1963, of a naval ballistic missile 48 feet long which the USSR says can be fired from above or below the surface of the water is another indication of the probable development of a long-range ballistic-missile strike force. The Soviet press agency Tass referring to the 1 May parade stated: "Soviet industry has equipped the Navy with powerful long-range rockets capable of firing a salvo at any time from a submerged or any other position and delivering a nuclear warhead to any point on the largest continent."

These events confirm a continuing program of research and development for substantially improving the capability of the Soviet Navy and in particular that of the ballistic-missile-launching submarine. These developments are major advances in the military capability of the Soviet Navy and may portend expanded tasks for Soviet submarines including that of participating in initial attacks on strategic land targets.

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IV. Specific Tasks of the Soviet Navy

The basic mission of the Soviet Navy can be broken down into separate tasks. There is considerable discussion in the Special Collection about strategic theory and the best means for accomplishing the separate tasks, all of which, however, are tailored to fit the basic concept of the naval mission. The problem before Soviet naval officers is well expressed by Admiral Kasatonov* early in 1960 in the following statement:

The qualitative leap in the development of means of armed combat on the sea, which has occurred in an unprecedentedly short period of time, has placed before the art of naval warfare a series of problems connected with the development of methods of operations ensuring the fullest realization of the potentialities of new weapons for effective accomplishment of the missions of the fleets. 1, p. 2/

The discussions as a whole seem to have generated a number of disputes about strategic and tactical theory and outline many problems including those of coordination of military-scientific technical work, military-economics, research and development, over-all weapons evaluation studies, and the modernization of communication and support.

Rear Admiral Bogolepov** early in 1962 called to the attention of Soviet military leaders that military scientific planning has not been

* Admiral Kasatonov at present holds the position of Commander in Chief of the Northern Sea Fleet, the most important operational command in the Soviet Navy. At the time that he wrote both articles for the Special Collection he was Commander in Chief of the Black Sea Fleet.

** Rear Admiral Bogolepov at the time that he wrote both articles for the Special Collection was engaged in scientific research under the Commander in Chief of the Soviet Navy. Apparently the major part of his naval career has been associated with scientific-technical and military-economic matters.

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attended by proper evaluation of the over-all military-economic effectiveness of various technical developments, as follows:

At a time when military-scientific technical work has, for a long time now, been carried out according to specific plans, often connected with large financial appropriations, and is usually fulfilled under rigid supervision, work in the field of military theory began to be planned only recently. It is poorly supervised and in a number of cases its quality leaves much to be desired.... . With all the need to give scientific personnel freedom in the selection of subjects, the over-all maneuvering of scientific forces and capabilities must, first of all, ensure research on all the essential questions with the necessary time limits Finally, while persons working on questions of armament and military equipment are constantly informed on the latest scientific-technical achievements in their field, since without this their work proves to be fruitless, the majority of the theoretical workers in the operational field, because of security considerations, are often not given access to documents that reflect pertinent achievements in the field of science and technology Of course, changes in the development of weapons and equipment determine changes in the development of military affairs. But, undoubtedly, military theory also exerts its own reciprocal influence on military equipment. Military technology cannot develop swiftly without being oriented by military theory. The latter has to indicate paths of development to military technology, the most effective ones from the standpoint of military art. Only on this basis is it possible to develop practical scientific-technical work in the most advantageous direction Now, when science and technology are developing so fast, acute scientific thought must be aimed at not less than ten years ahead. Only with this condition is it possible to possess modern armament and equipment of forces at any given moment, because scientific-technical and design work, the testing of experimental models, and the creation of large and small series, on the average, take just ten years In particular, the matter of research on

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comparative military effectiveness stands very poorly, including the military-economic profitableness of various methods of fulfilling particular strategic, operational, and even tactical, tasks. In conditions of the use of weapons of mass destruction, and their delivery to targets by missiles, almost any one of these tasks can be performed by various methods and correspondingly with various constituents of forces and weapons, belonging to various branches of the Armed Forces These forces, weapons, and methods are by no means equal in value -- both purely military and military-economic. But, unfortunately, such comparative investigations are mainly conducted in scientific organs of the separate branches of the forces, and this does not ensure their necessary depth and objectivity, not only as a result of "parochial favoritism" and, thus, of a biased attitude toward the capabilities of other branches of forces, but even as a result of the aforementioned insufficient knowledge of future possibilities of their neighbors, and likewise as a result of the lack of a common methodology of comparison. 11, pp. 4, 5, 6, 7/

Apparently automation has not been developed to the extent believed necessary by several Soviet naval officers for the purpose of operational control by fleet headquarters, navigation and fire control on board ship, **logistics**, and for other services. Although Captain First Rank Mamayev, * in mid-1962, discussed the need for automation in carrying out attacks against NATO's attack carrier groups, he implied that automation was lacking in the naval services generally:

The complexity and speed of an operation for the destruction of enemy carrier forces make the introduction of comprehensive automation into the system

* Captain First Rank Mamayev is the only naval author below the rank of Rear Admiral whose writings have been included in a special classified series. His article appeared in the SECRET special version of 'Voyennaya mysl' rather than in the TOP SECRET Special Collection. Little is known about the naval career of Mamayev. His position at the time of writing the article has not been identified.

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of control of the Navy and the automation of the necessary calculation processes urgently necessary.

It seems to us that all interconnected control links in the Navy should be automated. Automated systems for the control of forces, based on electronic computers, should be installed in submarines, in surface ships supporting submarine combat operations, in aircraft, in headquarters of naval and aviation large units, in fleet headquarters and in the Main Staff of the Navy.

An automated control system on board a submarine should, it seems to us, provide, for example, for the collection and processing of information on the situation, on the navigation of the ship, on combat maneuvering and on missile control and the firing of torpedoes. This system will make it possible to replace numerous instruments with a single electronic computer and to install a single control board for the submarine. The automation of the control of aircraft should insure the reliability of lengthy flights over the sea under difficult weather conditions.

Automation of the control system of large units of aircraft or ships will greatly facilitate the work of a commander and of his staff if it provides for the collection and processing of information on the situation, for the production of tactical calculations, and of calculations on maneuvering, on target allocation and on the preparation of target designations in the employment of weapons, and for the transmission of commands, of target designations, and of information on the use of weapons. Here, the coding and decoding of material should be provided for, together with the optimum choice of a line of communications. A similar system for the control of forces in an operation, if installed in the headquarters of a fleet and in the Main Staff of the Navy, will provide for the collection and processing of

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information on the situation, for the production of calculations on the use of forces, and means and for control of the large units of a fleet:

Automation of the control of the forces of a fleet should be augmented by a system of comprehensive automation of materiel-technical supply, capable of keeping an account of provisions and of determining the needs of the fleet, and of large units, ships, and units with regard to materiel-technical means, and able to plan the delivery, and control of transportation of materiel-technical means, and to plan medical support.

In order to introduce comprehensive automation on a broad scale, we must do away with technical conservatism and with a resigned attitude toward old methods, and must overcome the difficulties connected with the introduction of the new technique, using a fundamental approach to the problems of technical improvement. It would be unnecessary, for example, to introduce automation (which is so expensive) to compute the number of aircraft searching for the enemy in the ocean, using the "combing" method. This is "grandfather's" method, used in the 1940's and it cannot be taken as a guide; such calculations can be done with adequate speed and accuracy with paper and pencil. For reconnaissance, for example, automation of the calculations of the line on which enemy carrier attack forces will appear is necessary in order that a timely strike may be delivered against them.

It would also be advisable to automate computation of the timing of deployment of forces and of the quantity of these necessary for successful combat with carrier large units, as well as the best ways of using submarines and aircraft in the organization of strikes against a carrier attack force. The automation of control procedures will speed up the process of reaching decisions in situation which are frequently changing and which are sometimes unclear,

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and it will increase the effectiveness of the use of forces in the first operation for the destruction of the carrier attack forces of the enemy. 12, pp. 20, 21, 22/

In the following examination of the specific tasks considerable attention is given to the means, with particular reference to weapons, to be used to accomplish a given task. The solutions proposed by the naval authors presuppose certain theoretical strategy and tactics. It is therefore necessary to understand fully an author's theory before a complete evaluation can be made of his proposals. It is not the intent of this report to argue the merits of each author's theory but to examine those theories that are judged most likely to influence the development of forces and means to accomplish the several tasks. Whenever the authors discuss specific means, they are treated as weapons systems rather than being identified with certain projects existing either in the operational forces or in research and development. In general, the means fall into three general categories: (1) those means that are currently available to the Soviet Navy, (2) those means that have been proved to be technically feasible and are in some phase of development, and (3) those means that may be scientifically possible but for which there is insufficient evidence to make a judgment on the status of development. Although it is not always possible to categorize accurately the means discussed in the Special Collection, judgments are made based on the manner in which the means are discussed and on intelligence derived from other sources.

With respect to specific tasks, Soviet naval officers generally are agreed that the most important task in the initial period of a war is to prevent a nuclear attack on the USSR from NATO's attack carrier groups and Polaris submarines. Admiral Kharlamov, writing for the Special Collection late in 1961, summed up these thoughts and moreover included the policy of preemption as follows:

The only force capable of frustrating the first enemy strikes from the sea continues to be the Navy, and its basic task in the initial period of a war is to frustrate the nuclear/missile attack in the course of the enemy's so-called "all-out nuclear offensive" from the sea.

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Just as the missile troops, by their first strikes against objectives on enemy territory, will destroy those of his means of carrying on a nuclear/missile war which are located on land, so the forces of the Navy will have to perform this task at sea.

This is why the basic and primary task of our Navy in the initial period of a war will be to destroy the forces of the enemy navy, which along with other forces, comprise the basis of his nuclear/missile power. The first strikes of our fleet should be directed against such objectives as above all, missile submarines, carrier attack forces, and groupings of missile-carrying vessels at sea or in bases. 10, p. 4/

This task may be divided into two parts -- the destruction of NATO's attack carrier groups and the destruction of Polaris submarines. The means for combatting these forces encompass the major part of the Soviet naval fighting forces.

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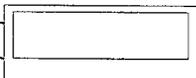


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V. Destruction of Attack Carrier Groups

Before the development of the US Polaris submarine, the greatest seaborne threat to the USSR was the attack carrier groups. The destruction of this force, therefore, was the task of highest priority, and it was against this force that the USSR developed its greatest naval defensive capability.

Captain First Rank Mamayev late in the spring of 1962 stated what may be current Soviet thoughts about NATO's carrier forces as follows:

In the leading NATO countries a revolution of the forces of the combined navies has recently been made. In performance of the tasks of armed conflict at sea, submarines equipped with missiles capable of destroying military-political and economic targets with high-yield nuclear weapons have moved into first place, ahead of aircraft carriers. However, the complement of the carrier fleet has not decreased. The plans of the NATO command provide, as before, for the retention in operation of 15 strike carriers. It is also a characteristic fact that new strike carriers have recently been brought into service, among them the atomic carrier Enterprise. The atomic carrier, according to views previously expressed by the U.S. naval command, should represent the basic nucleus of the offensive strength of a fleet.

The carrier aircraft fleet [park] has also been brought up to date. In the near future, a large number of new carrier attack and fighter aircraft will enter service. They have a ceiling of 24,000 meters, a flight speed exceeding 2,000 to 2,200 km, and the extent of their tactical radius of action is not less than that of the present heavy attack aircraft "Sky Warrior". On each carrier of the Forrestal type, as has now been established, about 80 aircraft are based, of which 40 to 50 are attack aircraft -- delivery vehicles for nuclear

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bombs -- for which there is a stock of about 140 nuclear bombs, which it is calculated will be expended during the first 72 hours after the beginning of a war (in peacetime the number of bombs on a carrier is approximately half of this). The combat capabilities of a carrier attack force (avianosnoye udarnoye soyedineniye) are significantly increased by its possession of such a quantity of nuclear bombs.

If it is accepted that a carrier attack force will consist of three aircraft carriers of the type mentioned above, about 200 nuclear strikes will be carried out by aircraft from such an attack force in the first three days after the start of a war, even though the losses of carrier aircraft in the air are not less than 50 percent. Thus, each day carrier-borne aircraft will destroy an average of some 60 to 70 large targets, located not only in the coastal zone, but also in the interior of the territory of the country. It follows that in spite of the revolution of forces which has been conducted, strike carriers have not lost their former significance in offensive operations at sea, and that they will retain this significance for at least the next decade, so that their destruction is one of the primary tasks at the outset of a war. 12, pp. 2, 3/

Captain Mamayev went on to point out the wide area over which aircraft carriers may be deployed and the strike range of carrier-based planes, as follows:

Let us now examine some of the practical questions of combat with these large units. As before, carrier attack forces possess unlimited capabilities in the choice of area for deployment and for the delivery of nuclear strikes. Nor has the distance of the take-off line [dal'nost rubezha podyema] for carrier aircraft changed. However, the method of using a carrier attack force has changed. In recent NATO naval exercises the use of carrier attack forces along a single operational-strategic axis has been practiced,

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and these have preceded dispersal into individual carrier groups, in each of which there is one, or at the most two, strike carriers and warships possessing various types of defense. These groups carry out combat operations while deployed at a distance of 150 to 200 miles from each other. Each such group is able to carry out, simultaneously, with its aircraft a minimum of some 15 to 20 nuclear strikes against our installations which are located at a distance of up to 2,000 km, and 25 to 30 strikes against targets at a distance of up to 1,000 km from its maneuvering areas.

The area over which a carrier attack force is now deployed may reach enormous dimensions (for example 300 x 150 miles). Therefore, in an operation for the destruction of carrier attack forces, particular importance is acquired by reconnaissance, by the creation of a large grouping of submarines and aircraft and by the determination of methods for their actions in the routing of the carrier attack force at sea [in the ocean].
12, p. 8/

A. Over-All Strategy

In general, the consensus of the naval authors seems to be that attack carrier groups must be engaged before strike planes can be launched. Although they recognize that this may not always be possible, there is no theoretical discussion about doctrine for combatting the carrier-based strike planes after they are launched.

Theoretical discussions about when or where carrier groups should be attacked include the destruction of carriers at bases, en route to operational areas, at the take-off line of its carrier-based strike planes, and while being serviced and refueled by support ships.

Many of the naval authors discussed at length the ways and means to accomplish this task, but Captain First Rank Mamayev, writing in mid-1962, made a critical analysis of previous proposals and submits thoughts

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of his own, which, because of relative later timing of his article, may represent more current theoretical thinking. He wrote:

Combat with carrier attack forces has already been discussed. However, we can not agree with a number of the propositions which have been stated. Several of these are, in our opinion, incorrect in principle, and some require more precise definition, since the use of a carrier attack force is now seen differently by the command of the NATO than it was earlier. Confirmation of this is found in recent exercises held by the NATO command.

It is also not entirely correct to consider the task of destroying the carrier attack force as being in all cases the main task of the submarines, of the naval missile-carrying aircraft and, to an equal extent, of Long Range Aviation. Long Range Aviation may, of course, take part in the destruction of a carrier attack force with part of its forces. But must this be considered a law? Assuredly, this is without foundation for the following reasons.

In the first place the basic function of Long Range Aviation is obviously that of action deep in the rear area of the enemy, and primarily that of destroying the nuclear/missile and aviation groupings of the enemy together with his strategic missile troops. Besides this, Long Range Aviation may also be assigned to perform tasks in the main theater of military operations. Naturally, under these conditions, one cannot expect that even before the beginning of hostilities, forces able to be at constant readiness, solely for operations against a carrier attack force, could be assigned from its complement.

Secondly, the basic weapons of Long Range Aviation -- missiles with powerful nuclear charges --

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are designed for the destruction of area targets of large dimension, such as large military-industrial targets, naval bases and ports, especially strongly built structures, nuclear weapon depots and structures which are underground or in rock. The weapons of naval missile-carrying aviation have been created for a single purpose -- destruction of mobile naval targets such as are represented by all surface warships, including large aircraft carriers and transport vessels. If such weapons are supplied as armament for individual large units of Long Range Aviation, these cease to be Long Range Aviation large units, in the true sense. By their nature these would be large units of naval missile-carrying aviation, although organizationally they might not enter the composition of the navy. Thus, the organizational designation has no significance here and the forces of the Navy will be cooperating not with Long Range Aviation as a branch of the air forces, but with aviation forces, which will strengthen it constantly and which will always perform their tasks within the framework of a naval operation.

In view of what has been said, one can not view an operation for the destruction of carrier attack forces solely as one in which, together with the basic types of naval forces of submarines and missile-carrying naval aircraft -- Long Range Aviation, troops of the Anti-air Defense of the Country, and Strategic Missile Troops -- will also participate. The situation in the initial period of a war may develop in such a manner that other branches of the armed forces will not be able to take part in this operation, at least not in its first stages, in which case the full weight of combat with the strike groupings of the enemy, and primarily with his aircraft carriers and missile-carrying forces, will rest upon our Navy. In such a case, this will be an independent naval operation, a fact which must not be lost sight of in scientific developments or in practical operational training. The devotion of proper attention

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to the independent naval operation will permit us to find the most effective methods for combat with the carrier attack force, and to determine the direction along which forces and means must be developed to support the combat operations of submarines and naval aviation.

Let us define the aim of combat with the carrier attack force. Sometimes, for example, it is asserted that this aim can be either destruction or weakening. In our view this is not entirely correct.

Since a carrier attack force always carries nuclear weapons, and has its own means for their delivery, one simply cannot speak of weakening such a grouping. In all cases one must strive for its destruction before the carrier aircraft have reached the take-off line (rubezh pod'yema).

For some reason it is sometimes asserted, without reservation, that combat with carrier attack forces should follow these lines; the destruction of the carrier attack force themselves, destruction of their mobile supply detachments at sea, and the destruction of the naval bases at which they are based. However, it is not indicated which of these lines will probably be the most important one.

If it is considered that the probable enemy will endeavor to unleash a war suddenly, in organizing combat with the carrier attack force one must proceed from the fact that at the start of a war all carrier attack forces will be, not at their bases, but at sea. Then, in the first four to five days of the war, they will be able because of their self-sufficiency to carry out combat operations without feeling the need to replace supplies of weapons or of material-technical means. This alone shows which means of struggle with the carrier attack force will become the most important in the course of

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the first days of armed struggle, at sea. As for the destruction of carrier attack forces at bases or of their supply detachments at sea, these methods will take on a subordinate character.

The destruction of bases, for example, will most probably occur as the result of strikes by Missile Troops aimed at disrupting the military and economic potential of the enemy, and not as the result of the destruction of the strike carriers at these bases. As for supply detachments, their destruction will not solve the problem of destroying the carrier attack forces. Carrier forces would only lose their combat effectiveness temporarily as a result, and would be able to regain it quickly; the destruction of all the detachments is no less difficult a task than combat with the carrier attack force. 12, pp. 3, 4, 5, 6, 7, 8/

Captain Mamayev made a highly significant statement when he wrote: -

The devotion of proper attention to the independent naval operation will permit us to find the most effective methods for combat with the carrier attack force, and to determine the direction along which forces and means must be developed to support the combat operations of submarines and naval aviation. 12, pp. 5, 6/

In this statement he indicated that much study was yet to be done not only on strategy and tactics but also on the development of forces and means.

Similar to the debate regarding the assignment of responsibility for destroying shore targets* is the debate regarding the destruction of enemy naval ships at their bases. Admiral Kasatonov regarded the main mission of the Navy to be the destruction of enemy naval vessels

* See VII, p. 151, below.

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at sea and states: It is advisable to entrust the destruction of enemy naval vessels at their bases to the Missile Troops of the Supreme High Command, which can accomplish such missions more effectively. 1, p. 6/ Kasatonov seems to acquiesce to the decision referred to earlier in this report by Platonov.*

Captain Mamayev concluded his article with an interesting statement regarding the need for a "critical appraisal" of the theories that had been developed up to mid-1962 as follows:

The new features of combat with carrier attack forces which have been examined are the result of the adoption into the armament of the navy of a new weapon and of its delivery-vehicles -- submarines and aircraft. Of course, by no means all the natural consequences of this have yet been brought to light. However, the time has come for a critical appraisal of everything which has been worked out in the past on the questions of combat with carrier forces. An attempt at this has been made in this article. 12, p. 22/

Rear Admiral Zvyagin,** writing early in 1961, did not even mention the destruction of attack carrier groups, thereby implying that this is not a task in which surface ships will participate.

B. Reconnaissance

Although the naval authors agree that aircraft and submarines are the best means at present for reconnaissance and target acquisition, debate is still going on regarding deployment of these forces and the advantages of one over the other.

Captain Mamayev stated:

The most difficult task is reconnaissance and observation of the carrier attack force, and the assignment of

* P. 53, above.

** Rear Admiral Zvyagin at the time that he wrote for the Special Collection apparently was a line officer in an unidentified capacity with Soviet naval surface forces.

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forces which possess a wide radius of action. This would be, moreover, in the period of the first operation, when the basic forces of the fleet are directed towards the destruction of carrier forces as the main targets, destined for destruction during the first hours of the war. 12, p. 8/

One of the tasks conducted by our reconnaissance in peacetime must be to ascertain the dimensions of anti-submarine defense lines and the nature of their equipment, since the overcoming of these lines will present difficulties -- firstly by causing a considerable increase in the time required for the deployment of submarines, which, even without this, will be lengthy.

This is why it is also necessary to have organized forces and developed methods for the control ahead of time, together with a system for the mobile and dispersed basing of the navy. 12, p. 12/

Rear Admiral Bogolepov, in October 1960 compared the economics of reconnaissance by diesel submarines with that of aircraft to show that aircraft are more advantageous, as follows:

As a result, when the enemy has at his disposition routes in an ocean zone with a width of 500 to 600 miles, then for dependable assurance of only a single attack of a convoy by a group of submarines, it is necessary to deploy ahead of this group two reconnaissance screens of 15 to 20 submarines each. With a coefficient of operational utilization of diesel submarines of not more than 0.1 to 0.15 for such uninterrupted reconnaissance (and only for reconnaissance), it would be necessary to have for only one ocean direction, not considering possible losses, 200 to 400 or as an average, about 300 submarines, at a total cost of 12 to 15 billion rubles. Meanwhile, for the accomplishment of the same reconnaissance mission by aviation, with two or three flights daily by paired flights of aircraft and with an intensity of 6 to

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8 flights per month for one aircraft, 16 to 30 are needed, or an average of 20 to 25 aircraft with a total cost of 1 to 1.5 billion rubles. Figures are eloquent, and with regard to possible losses, such a comparison will be still more to the disadvantage of diesel submarines

Perhaps these calculations and conclusions will appear to someone to be exaggerated. But, it is enough to analyze the experience of the Second World War, in particular the extraordinary decrease in the effectiveness of the operations of German submarines because of their poor aerial reconnaissance support, in order to arrive at the same conclusions. And since at present the main bulk of submarines still have diesel-electric engines, the question of supporting submarines with aerial reconnaissance is exceptionally important.

Of course, nuclear submarines present another perspective. Considerably surpassing in their submerged speed the average speed of convoys, they can combine reconnaissance with attacks, even repeated attacks. Calculations still show that aerial reconnaissance can also substantially increase their effectiveness. 2, pp. 7, 8/

Admiral Panteleyev, in July 1961, pointed out that in the use of submarines against attack carrier groups target acquisition must be from either reconnaissance aircraft or submarines, as follows:

Upon receiving a combat mission to destroy a carrier strike force, a submarine (or a group of them) must, at the present time, first of all be guided to the target either by aircraft or by a reconnaissance screen of submarines. 7, p. 7/

Captain Mamayev, in mid-1962, agreed with the earlier comments of Rear Admiral Bogolepov regarding the superiority of aircraft over submarines, even nuclear-powered submarines, for reconnaissance. He wrote:

Reconnaissance is responsible for the timely detection of the carrier attack force and for establishing

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observation, not of the large unit as a whole, but of each of its groups. The timely discovery of all carrier groups is becoming an extremely critical problem. Reconnaissance aircraft are able to perform this task most adequately. It is true that great hopes have been placed in submarines. However, in our opinion, there is little basis for this. The capabilities of reconnaissance submarines are significantly less than those of reconnaissance aircraft. The only advantage possessed by submarines lies in their ability to attach themselves to a single carrier group and to follow it unceasingly, maintaining prolonged observation of it secretly. Against this, aviation is able, in a short period of time, through the use of single aircraft, to survey enormous stretches of ocean, and to discover the complete operational formation of a whole force, and the order which carrier groups are following. This is, unfortunately, impossible for submarines. Moving with the same speed as carriers, they cannot leave them, and if they should, renewed contact with the same group is difficult to achieve. Thus, nuclear-powered submarines remain an auxiliary means of reconnaissance, as diesel-battery submarines were in their time. 12, p. 9/

Although Rear Admiral Zhukovskiy, writing in October 1961, pointed out that nonnaval forces should be used to aid in the detection of submarines, it would seem that the observation of surface groups would be an even less difficult task, and, therefore, these nonnaval forces could be used in an early warning role particularly in the more distant ocean areas, as follows:

It is advisable to carry out combat operations to destroy enemy submarines at sea, particularly in the initial period of war, by enlisting the maximum possible quantity of anti-submarine forces and facilities of the fleet and also the ships and aviation of the maritime fleet, the fishing industry, and the Chief Directorate of the Northern Sea Route,

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which are capable of carrying out observation of enemy submarines. In the period preceding the initiation of combat operations, all of the forces mentioned should be deployed in the zone covered by the system of antisubmarine defense in the theater, beyond the limits of this zone on the approaches to the points of basing of the submarines of the probable enemy, and on the routes of their movement into areas of combat operations. 9, p. 14/

C. Joint Operations of Submarines and Aircraft

The naval authors seem to agree that strikes against carriers must be a coordinated strike, but circumstances of weather, location, and situation of threat would influence the use and deployment of these forces.

Captain Mamayev seems to sum up these thoughts and to show that improvements in weaponry and capabilities generally are changing earlier concepts about joint strikes when he states:

Submarines and naval aviation are capable of destroying a carrier attack force with one strike regardless of whether it is moving in a single formation or in separate carrier groups. Of course, in the latter case, units of the naval forces will not be committed to battle at once, but in accordance with the approach of each group to the take-off line of its carrier aviation. However, the destruction must be accomplished as the result of a single strike rather than of many.

Here there is no need for an examination of the question of which type of forces should perform the main task. It must be performed both by submarines -- those equipped with atomic propulsion -- and by missile-carrying aircraft.

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It should be noted at this point that in case the problem of destroying a carrier attack force arises suddenly, Naval and Long Range Aviation may prove to be the only forces able to fulfill the task consistently and at high speed. All measures are therefore being taken, even in peacetime, to maintain these types of aviation at a state of high combat readiness. This fact must be taken into account in working out possible variants for the development of the first operation. However, other factors should also be kept in mind: in difficult weather conditions, the capabilities of submarines for combat with carrier forces may at present prove to be considerably greater than those of existing piloted aircraft, and in such cases the task of destroying carrier attack forces must be performed mainly by submarine forces.

The delivery of a combined strike against a carrier attack force or one of its groups will be more effective than could have been expected when aviation had no long-range missiles, and when existing missiles could be guided only when launched separately from a single direction. Now submarines, too, have no need to approach the target being attacked closely. They (missile-carrying submarines, for example) can use their weapons even without entering the zone of the strongest anti-submarine defense of the enemy. Thus, missiles with nuclear warheads, which are carried by both submarines and aircraft, are altering our previous ideas on operations by these forces in a joint strike. 12, pp. 16, 17/

D. Role of Naval Aircraft

During the years 1959-60, tactical fighter aircraft were withdrawn from the Soviet Naval Air Forces. Significantly, none of the naval authors discusses even the theoretical desirability of again having fighter aircraft under naval control. Combatting NATO's naval strike aircraft in flight is tacitly left to the air defense forces (PVO Strany) of the USSR.

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Admiral Tributs may have been protesting such actions as the above when he wrote in October 1960: "Therefore, the simplification and narrowing of the missions of the Navy which are going on are premature and completely unjustified measures." EC-3, p. 9/

The role of naval aircraft is one of reconnaissance, target acquisition, and strikes with air-to-surface missiles (ASM's) against the attack carrier groups. The naval authors seem to agree that aircraft generally is superior to submarines for these missions but recognize that both operational range and weather are severe limitations in aircraft operations. Moreover, they agree that aircraft must jointly coordinate strikes with submarines.

The naval authors view the limitation in range of the current reconnaissance and strike aircraft, the Tu-16 (Badger), as a severe handicap for their task and plead for long-range aircraft, particularly for reconnaissance aircraft. The Tu-16 has an optimum unrefueled radius of 1,600 nm. With air refueling -- a well-established capability in naval air regiments -- this aircraft has an optimum combat radius of 2,300 nm.

The equipping of Tu-16's with ASM's armed with nuclear warheads, which have a range of about 100 nm, provides a strike force that can be brought to bear early in the initial phase of combat with attack carrier groups.* Under certain conditions, this force may be brought to a combat zone even earlier than submarines, which already may have been on operational patrol.

Regarding the use of aviation, Admiral Kasatonov is more specific than other authors. He observes that in a closed sea theater, aviation will be of greatest use in the first days of a war because of the time required to move submarines through the straits. He proposed the inclusion of long-range aircraft in Naval Air Forces as follows:

It is necessary to have at the disposal of the fleet missile aviation capable of delivering strikes

* It is estimated that by the end of 1963 all of the approximately 150 Badger B aircraft in the Naval Air Force which have been equipped with Kennel 55 nm ASM will have been phased out and have been replaced by Badger C aircraft configured to carry the Kipper 100 nm ASM (see Appendix C).

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against enemy naval vessels with cruise missiles, both independently and in coordination with submarines, at a distance of up to 3,000 to 4,000 kilometers from their airfields. To carry out aerial reconnaissance for these forces, there must be long-range reconnaissance planes in the composition of the reconnaissance aviation of the Navy. 1, p. 7/

In order to overcome the enemy anti-aircraft defense system (both the land anti-aircraft defense system and the anti-aircraft defense systems of the aircraft carrier attack force itself), it is necessary that all branches of aviation make maximum use of low flight altitudes, right down to hedgehopping. We believe that flight at minimum altitudes must be maintained by strike groups of aircraft both over the sea and over enemy territory, insofar as local terrain permits. Taking on altitude should be done only when the objective of the strike has been approached to within limits ensuring the possibility of launching and guiding [navedeniye] airborne cruise missiles. 1, p. 16/

Admiral Kasatonov gave some information on the characteristics of missiles for naval aircraft apparently available or nearly so in early 1960, as follows:

For the conduct of combat operations against aircraft carrier attack forces at sea during the first days of a war, aviation will have the greatest use To destroy an aircraft carrier attack force having a powerful anti-aircraft defense which is echeloned in depth, it is necessary to deliver concentrated strikes by missile aviation forces using cruise missiles with nuclear warheads [snaryazheniye]. Since the explosion of only one missile with a nuclear warhead hitting the calculated point is sufficient to destroy any class of vessel, the expenditure of such missiles will be only one fifth or one sixth of the expenditure of missiles with conventional warheads.

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Considering the vulnerability of cruise missiles to anti-aircraft artillery and anti-aircraft guided missile fire, it is advisable to employ salvo launching of missiles in delivering strikes against a strongly defended objective. In view of this, the invulnerability to jamming of cruise missiles has great importance, permitting the use of a large number of them in each salvo. According to calculations, the destruction of one aircraft carrier operating as a component of an aircraft carrier attack force (allowing for the opposition of the anti-aircraft artillery of the vessels and four two-missile salvos of anti-aircraft guided missiles) can be accomplished by one salvo of six airborne [aviatsionnaya] cruise missiles with nuclear warheads launched at a distance of 200 to 220 kilometers from the aircraft carrier attack force. With a strike by six-missile salvos from two directions simultaneously, the destruction of two large vessels (an aircraft carrier and a cruiser) of an aircraft carrier attack force can be accomplished. In this case, of the twelve missiles launched in the two salvos, it is sufficient to have only six or seven missiles with nuclear warheads, and the other five or six missiles can have conventional warheads without causing substantial degradation of the results of the strike (the loss of delivery aircraft en route is not allowed for here).

A somewhat different picture is presented with the use of "Komet" missiles, which are vulnerable to jamming. In this case, in view of the impossibility of a salvo launching of the required number of missiles from one direction, increasing the density and reducing the depth of the combat formation of the delivery aircraft is achieved by organizing it into several parallel columns [waves], and also by launching two or more missiles on the beam [v luche] of one leading delivery aircraft. An indispensable condition for increasing the density of the strike is to attack from several directions. The experience of combat training confirms

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practically the feasibility of launching "Komet" missiles from several directions, 45 to 60 degrees apart. Calculations show that in an attack from three or more directions the probability of the "Komet" missiles reaching the target increases to 25 percent, as against 10 percent in an attack from one direction. 1, pp. 14, 15, 16/

Captain Mamayev, writing in mid-1962, considers aircraft, within their range limitations, as having considerable advantages over submarines for reconnaissance, for target acquisition and for launching missile strikes against attack carrier groups, but he pleads for long-range aircraft to improve the present capability of naval air. Recent long-range reconnaissance flights over US carriers in the Western Pacific and North Atlantic by Tu-95 (Bear) aircraft indicates a shift probably has been made in Soviet policy.

E. Role of Submarines

The naval authors agree that diesel submarines, which make up the bulk of the Soviet submarine fleet, are extremely limited in combat capabilities with fast carrier forces and that "lying in wait" and barrier patrol seems to be the best deployment of this type of submarine. The combat capability, however, has been increased considerably by the use of atomic torpedoes and by equipping some of these submarines with cruise missiles. The authors regard nuclear-powered submarines as the only submarines force capable of maneuvering for repeated attacks, reconnaissance, tracking, and for operation largely beyond the range of Soviet long-range aircraft. The theoretical discussions about the best means to combat attack carriers seem to be based on the performance of nuclear-powered submarines that are armed with atomic torpedoes or cruise missiles with nuclear warheads or both.

Admiral Kasatonov,* writing in early 1960 about the use of naval forces in a closed sea theater, discussed the use of both torpedo

* Admiral Kasatonov is widely quoted in this section because of his position as a leading fleet commander. At the time that he wrote both articles, one early in 1960 and a later one in October 1961, he was Chief of the Black Sea Fleet. In May 1962 he was made Chief of the Northern Fleet, the most important fleet command post in the Soviet Navy.

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armed and cruise missile-armed submarines and in particular atomic submarines. He wrote:

Having penetrated into the area of combat operations, the submarine must carry out combat operations for as long a period of time as possible with maximum effectiveness. This requirement is met to the greatest degree by fast submarines with atomic engines, armed with long-range torpedoes with nuclear warheads (with the condition that the depth of the sea permits atomic submarines to run at maximum diving depth as, for example, in the Mediterranean Sea).

Being able to stay at sea for a practically unlimited period of time, atomic submarines can be in waiting areas sufficiently remote from the zones most densely saturated by the forces and facilities of antisubmarine defense, execute a swift movement to deliver nuclear strikes against detected enemy vessels, and subsequently break away from pursuit by the antisubmarine forces. Beyond the limits of a closed sea it is also advisable to use missile submarines (with the condition that they use cruise [krylataya] missiles with homing [samonavedeniye]). However, for this, the execution of special measures for the organization of accurate target designation and subsequent replenishment of expended missiles will be required.

It is advisable to have in the composition of a fleet in a closed sea theater, submarines armed, not with ballistic missiles, but with cruise missiles, assuring the possibility of multipurpose use of the same submarines. To the credit of cruise missiles there is one more circumstance of no small importance, that with their launch from submarines the enemy does

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not have the opportunity of getting a fix on the missiles in flight to determine the trajectory and the point of launch, and consequently, the location of the submarine.

It is advisable to use atomic submarines armed with torpedoes only for strikes against large enemy vessels. It is advisable to assign to them waiting positions outside the limits of the zone of probable movement of the aircraft carrier attack strike force, because the forces of the enemy antisubmarine defense will carry out their most intensive search for submarines in that zone. In delivering strikes, atomic submarines, using their great underwater speed (50 to 60 kilometers per hour), approach the aircraft carrier attack force on the basis of reconnaissance information, with the design of delivering the strike from the bow angles [nosovoy kursovoy ugol] of the enemy. In this case submarines can launch nuclear torpedoes against the vessels of the aircraft carrier attack large unit from distances of 15 to 20 kilometers, without penetrating the curtains of distant and close vessel protection of the aircraft carriers. On the other hand, when delivering attacks from astern, a submarine must approach to within a distance of 4 to 5 kilometers of the enemy vessels. Both for self-defense and in the interest of combatting enemy missile-carrying submarines, atomic submarines must destroy every enemy submarine detected, and to do this they must have reliable antisubmarine weapons and equipment for the detection of submarines.

The positions for missile submarines must be chosen with the design of carrying out a shift [manevr] of trajectories of the cruise missiles which will cover the largest number of probable directions of enemy

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movement. Considering the necessity of salvo firing, missile submarines are most advisably employed in groups, ensuring the launching of six to eight cruise missiles in one salvo. According to calculations, in this case, in the delivery of a strike against an aircraft carrier attack force of typical composition it can be guaranteed that one of the missiles with a nuclear warhead will reach the target.

The most crucial problem in organizing such a strike is providing the missile submarines with accurate data on the location and factors of movement of the enemy for calculating an aiming point which ensures the lock-on [zakhvat] of the enemy vessels by the homing system of the missile. With clear-cut organization of the control of submarines and aviation, this task can be accomplished by aviation carrying out a thorough reconnaissance [dorazvedka] of the enemy. Also exerting great influence on the success of the firing is the accuracy with which the submarines determine their own position; this can be ensured by the use of radio navigational instruments of high accuracy and by further improvement of the navigational instruments on submarines. * 1, pp. 6, 9, 17, 18/

Rear Admiral Bogolepov, writing in October 1960 on a comparative analysis of submarines versus aircraft for reconnaissance, made an interesting comment regarding submarines, as follows:

Since at present the main bulk of submarines still have diesel-electric engines, the question of

* Supplemental to Admiral Kasatonov's reference to the underwater speed of 50 to 60 kilometers per hour is the reference in "Journey of Soviet Atomic Submarines to North Pole," that appeared in Izvestiya of 29 January 1963, p. 6, in which Captain Second Rank L. Zhiltsov, commander of the atomic submarine, said that when he was ordered to return to the base immediately he "traveled underwater at more than 60 kilometers per hour."

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supporting submarines with aerial reconnaissance is exceptionally important. 2, p. 8/

Here he implies that they have some submarines with another form of propulsion. He follows the above statement with "Of course, nuclear submarines present another perspective," thereby implying that nuclear power is the only other form of propulsion being considered.

Admiral Panteleyev, commenting on the weakness of aircraft to defend against aircraft carriers, pointed up some of the advantages of submarines. He also considers organization for operations in July 1961 as being incorrect, as follows:

The submarine fleet possesses incomparably great capabilities for combat with carrier attack forces. It may be deployed in complete secrecy, during the period of exacerbation of the military-political situation, to those very areas of the ocean or sea, designated by the enemy as zones for the deployment of his forces for a strike against our installations.

For the execution of an independent submarine operation to sink the enemy strike aircraft carriers, is it sufficient to have only atomic submarines with nuclear weapons? No, it is not sufficient! The resolution of this mission requires an entirely new organization of large units of the submarine forces. In the interests of ammunition supply and technical servicing, submarines are still grouped in large units on the basis of class and type (submarines with atomic engines, submarines with diesel engines, submarines with torpedoes, submarines with missiles, etc.). Such large units are not suitable for carrying out independent submarine operations. 7, p. 7/

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Admiral Panteleyev made an interesting observation about the capability of NATO and the range of Soviet torpedoes and missiles. He stated:

It is doubtful that the existing hydro-acoustical equipment of the enemy will be able to determine accurately the entire depth of the operational makeup of the submarine forces and the large number of attacking submarines deployed at various depths. In any event, the ranges of this equipment are still much less than the ranges of our modern long-range torpedoes, let alone missiles. 7, p. 8/

Rear-Admiral Lisytin, in January 1961 wrote on the capability of the Navy to deliver strikes at moving objectives at sea and refers specifically to the operation of August 1960* regarding the probable success of submarines in attack on attack carrier groups, as follows:

The most important quality, peculiar to the Navy, is its ability to deliver powerful strikes at moving objectives at sea. The forces of the Navy, armed with modern missile/nuclear weapons, possess a high degree of operational-combat capacity. Thus, the operational-strategic exercise conducted by the Commander-in-Chief of the Navy in August 1960 showed that even one submarine with an atomic power plant can make repeated attacks on a carrier strike large unit at sea and destroy one or two large vessels. A brigade of such submarines can successfully accomplish the mission of destroying a carrier strike large unit consisting of several aircraft carriers and operating in a definite direction occupying, along the front [two or three words missing]. 4, p. 4/

* It is possible that this exercise was the first operational exercise of any magnitude in which a Soviet nuclear-powered submarine participated.

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Lisyutin proposed the deployment of forces where enemy deck-based aircraft will take off and made a differentiation in the use of atomic and "diesel-battery" submarines in the case of combat operations. He wrote:

Consequently, our forces should be deployed on the probable lines where the enemy's deckbased aircraft will take off. Here, too, should be concentrated the main efforts of atomic and diesel-battery submarines and missile aircraft using nuclear weapons, for the most part.

In such circumstances, missile aircraft, after reloading, prepare for a repeated strike at the carrier attack forces when the latter makes a new attempt to approach the line for launching deckbased aircraft, while atomic submarines pursue the enemy and inflict repeated blows on him.

At the beginning of combat operations, diesel-battery submarines, disregarding the lines of takeoff for deck-based aircraft, should move farther ahead with a view to inflicting preventive strikes on aircraft carriers before the carriers repeat their approach to the line of takeoff for deckbased aircraft. Naturally, after the beginning of combat operations, the lines where the main efforts are to be concentrated should be selected with a view to delivering strikes on the carrier attack forces before they approach to within range of deckbased aircraft. Atomic submarines, making use of their great maneuverability, can deliver strikes on carrier attack forces in the ocean wherever they overtake them. 4, p. 8/

stated: Captain Mamayev, writing on the potential of atomic submarines,

Arguments that the location of carriers in distant regions of an ocean precludes their

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destruction are unfounded. Atomic submarines will clearly be able to carry out combat operations against the carrier attack forces anywhere in the oceans of the world. Moreover their missiles and torpedoes with nuclear warheads permit them to achieve complete destruction of the enemy. 12, p. 6/

Captain Mamayev agreed with Lisytin about predeployment of submarines and remarks that this was easier because of the "disposition of the fleet near the border". He added:

In addition, submarines need to deploy oceanwards from their bases initially even before the beginning of an operation. Disposition of our fleets near the borders makes it possible to accomplish this. However, it must be taken into account that lines of anti-submarine defense, of which enough has been said already, will present a considerable obstacle to the submarines of the Northern Fleet. 12, pp. 11, 12/

Captain Mamayev went further to discuss both atomic and diesel submarines in combat with carriers, as follows:

As for submarines, they are the type of force which provides for the repeated delivery of strikes against the enemy over a lengthy period of time.

In speaking of submarines, we are thinking of those with atomic propulsion; torpedo-carrying diesel-generator driven submarines are of little effectiveness as a force for combat with carrier attack forces. In our view, these submarines can count only on a minimum of success, and then only if a carrier force for some unknown reason, fails to detect them and passes through their position. In the event of an unsuccessful attack, these submarines, because of their slow speed, will have no chance to re-deploy for repeated attacks. It is true that diesel-generator

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submarines can nevertheless count on success in a final strike against a carrier force which has already been routed, but only at a time when the surviving carriers are taking on fuel, when the mobility and maneuverability of the remaining part of the unit has been reduced to a minimum.

The assertion that the shortcomings of diesel-generator driven submarines, which result from their extremely limited capabilities for operations against carrier attack forces, can be made up by the deployment of a large number of them, or to put it more precisely, of a "large mass" [bolshaya massa] of such submarines is a most dubious one. It is difficult to imagine the number of submarines which would have to be deployed in an ocean, and how it would be possible to cover all the routes for crossings by carrier forces with them, so as to insure the emergence of the maximum number of submarines against a carrier attack force and the execution of a strike. 12, p. 13/

In Admiral Kasatonov's second article, written in October 1961, he reexamined the capabilities of submarines and in particular the use of atomic torpedoes, in strikes against carriers as follows:

We are completely aware that the operations of diesel-electric submarines, particularly against carrier strike large units and fast, strongly protected convoys, will be conducted with great difficulties. However, even these submarines will be able to operate successfully against less fast-moving targets.

The operations of atomic submarines will undoubtedly be more effective. The great maneuvering capabilities and the enormous range of these boats make it possible for them to be used to deliver strikes against carrier attack forces not only in

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areas of combat maneuvering of the latter and in the approaches to them but also on the lanes used by the carriers in crossing the ocean and on the approaches to distant bases across the ocean.

Without being inferior in speed to aircraft carriers, and exceeding the speed of the fastest convoys by 1.5 to 2 times, the atomic submarines can attack them from any direction and avoid encounters with the hunter-killer groups of the antisubmarine defense which usually take up positions in forward areas of the movement of the carrier attack forces or the convoy.

The use of atomic torpedoes increases even more the combat capabilities of the submarines. Incidentally, we cannot agree in any way with Admiral V. Platonov in his negative evaluation of atomic torpedoes, much less the long range ones. The advantages of atomic torpedoes are obvious. Thus, to destroy a ship of any class, it is sufficient to strike it with one atomic torpedo within semicircle with a radius equal to the radius of destruction of the given target. We note that to destroy any ship such as a strike aircraft carrier, we must hit it with no less than 8 to 10 torpedoes with conventional filling. As a result of the fact that to destroy a ship with an atomic torpedo, it is sufficient not to guarantee striking the ship directly but in a semicircle with a sizable radius, the probability of destroying the target with this torpedo increases greatly and in several instances approaches one.

Finally, one must keep in mind that in using torpedoes with conventional charges, because of their small radius of destruction, the firing is usually done by four-torpedo salvos, but in using atomic torpedoes the firing is done with single torpedoes. Therefore,

if a submarine replaces conventional torpedoes with atomic ones, then with the use of the same number of torpedoes, the number of possible effective attacks increases by four times, i. e., the self-sufficiency of a submarine in ammunition increases by four times. 8, pp. 5, 6/

F. Means Currently Available to Combat Attack Carrier Groups

In the discussions published in the Special Collection concerning combat with attack carrier groups, the authors reveal that aircraft armed with cruise missiles and diesel-powered submarines armed with torpedoes or cruise missiles make up the bulk of the defensive force of the Soviet Navy. The authors further reveal that nuclear submarines are coming into the fleet and that reconnaissance for all these forces must be provided principally by aircraft.

The strike/reconnaissance capability of the Soviet Naval Air Force has been strengthened over the past several years by both the increase in numbers of medium jet bomber (Badger) aircraft and the conversion of virtually all of the strike units (Badger) to carry ASM's.* The bulk of the air-to-surface missile equipped aircraft in the USSR now is assigned to the Naval Air Force.

Because the authors are not usually specific in naming the various types of vehicles and weapons available to them in these categories, it is of interest to consider what these are, as revealed not only in the Special Collection but also in other intelligence.

The "missile aviation of the Navy" so often referred to by the authors undoubtedly refers to the naval units of the Tu-16 (Badger)** jet bomber. The ASM's designated by Western intelligence as Kennel and Kipper*** known to be available for these aircraft have ranges of 55 and 100 nm, respectively. Admiral Kasatonov's description of

* See Appendix C.

** See the map, inside back cover.

*** The Soviet designation of the Kipper is K-10.

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the ASM that he calls "Komet" is believed to correspond to the Kennel and the missile whose range is indicated by Kasatonov to be 108 to 118 nm apparently corresponds to the Kipper.

A third ASM designated KANGAROO* by Western intelligence has a range of 350 nm and is carried only by Tu-95 (Bear)* turboprop aircraft of the Long Range Air Force. That this weapon is not specifically described by Kasatonov along with Kennel and Kipper probably is due to the fact that it was not under naval subordination, but he appears to assume that it may be employed against carrier groups. This assumption is strengthened by a statement by Colonel-General S. Ivanov in commenting on the naval maneuvers of NATO that were carried out in the fall of 1960 under the code name of FALLEX - 60**:

In the formation of the forces of the NATO strike fleet in the maneuver area there were a number of weaknesses, which must be noted in order to organize measures for combating them. If the radar patrol elements are destroyed or neutralized, then the local security forces will not be able to defend the strike carriers successfully from strikes by long-range bombers armed with the K-10 or, especially, the K-20, or from submarines armed with the new missiles. The operational groups are in the maneuvering area for 36 hours, which facilitates combat against them.

Captain First Rank Mamayev on the other hand, in his appraisal of strategy, *** expressed doubt that missile aviation of the Long Range Air Force, as it was then constituted and oriented largely against land targets, could be employed against carrier groups.

* The Soviet designation of Kangaroo almost certainly is K-20. See Appendix C.

** See the article "The FALLEX - 60" Maneuver of the Armed Forces of the NATO Aggressive Bloc," by Colonel-General S. Ivanov, pp. 12 and 13, published in the fourth issue of the Special Collection for 1961, which went to press on 20 October 1961.

*** See p. 68, above.

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The naval authors are unanimous in their statements that the Navy needs long-range reconnaissance aircraft. Captain Mamayev gave the Soviet designation Tu-16R for the reconnaissance version of the naval version of the Badger and deplors its inadequate capabilities in the following statement:

Basically the capabilities of aerial reconnaissance are technically determined by two factors -- the range of the aircraft and extent to which they are equipped with technical apparatus. Unfortunately, neither the range nor the equipment of existing reconnaissance aircraft fully meets the requirements for the conduct of reconnaissance at a great distance without establishment of visual contact with the target being reconnoitered. The Tu-16R aircraft, as is known, has a limited tactical range in relation to the dimensions of the oceans. Without inflight refueling they cannot even reach the northern part of the Atlantic Ocean. However, in order to achieve the successful destruction of carrier forces it would be necessary for them to reach at least a significant part of the world's oceans. 12, p. 10/

Mamayev, in mid-1962, also pointed to the great help that the reconnaissance version, Tu-95R, could be to the Navy, but pointed out that no such aircraft are assigned to the Navy:

It is true that the T-95R aircraft has great capabilities for long-range operation alone. The presence of such aircraft in the reconnaissance forces of the navy would make ocean reconnaissance to some extent practicable. However, naval aviation does not have any such aircraft in the composition. Thus, for the time being, there is no possibility of meeting the requirement of naval strike forces for reconnaissance data if a war should break out. It can not be hoped that long-range aviation will be assigned to reconnaissance, and that it will immediately and successfully cope with the functions entrusted to it. The practical operational training of the fleets has not yet produced any such positive results.

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It is only the receipt from industry of the above-mentioned type of aircraft, which also have installed in them, for reconnaissance purposes, sets for guiding the flight of missiles of the "air-to-ground" class, launched from the same type of aircraft, which will represent the first step towards the solution of the critical problems of reconnaissance at sea. In other words, one of the problems of reconnaissance of carrier attack forces can be resolved by administrative action, and is awaiting solution. 12, p. 10/

Recent long-range reconnaissance flights over US carriers in the Western Pacific and North Atlantic by Tu-95 (Bear) aircraft (both reconnaissance and air-to-surface missile carrying types) and in particular the flights to the area of the Azores, may indicate that the "administrative action" advocated by Mamayev was decided favorably for the Navy, making long-range aircraft available to the Soviet Navy for the first time. (The Tu-95 has an unrefueled combat radius of 3,900 nm.)

Although the Tu-95 is not currently in production, production could be resumed, or some existing units could immediately be transferred to the Soviet Naval Air Force. Alternatively, reconnaissance and strike tasks for the Navy might be assigned to the Long Range Air Force, although such division of responsibility obviously would be undesirable in the eyes of the Soviet Navy.

Rear Admiral Bogolepov, in considering reconnaissance of carrier groups by submarines, * concludes that because most Soviet submarines are diesel powered and have an inadequate "coefficient of operational utilization", they cannot be effective in the anticarrier strike role. Intelligence estimates [REDACTED] confirm Bogolepov's statement made in 1960 that most Soviet submarines are diesel powered. As of January 1963, only 26 nuclear submarines are estimated to be among the more than 300 long-range submarines in the Soviet fleets. **

* See p. 73, above.

** The operational deployment of Soviet submarines among the fleets is given in Appendix C.

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The naval authors admit that reconnaissance by nuclear submarines would be more effective than by diesel submarines, but in general they favor aircraft reconnaissance.

The "atomic submarines" referred to in the Special Collection for employment against carrier groups probably are the N-class torpedo-attack submarines and the E-class cruise-missile submarines.* However, even the Soviet H-class nuclear-powered ballistic-missile submarines, of which there were about 10 at the beginning of 1963, may be assigned a mission against carrier groups in the initial period of a war. Such an assignment would be the result of the H-class submarines being equipped with torpedoes and being one of the very few submarines available to attack carrier groups at great distances from the Soviet shores, even though its ballistic missile armament obviously is intended for land targets.

The diesel-powered submarines referred to in the Special Collection as having a limited capability against carrier groups probably are the W and R classes,* which have a maximum operational radius of 3,000 nm,** and the Z and F classes,* which have a maximum operational radius of 6,000 nm.** All these submarines are armed with torpedoes, and, in addition, two types of W-class submarines that have been armed with cruise missiles, designated "Twin Cylinder" and "Long Bin",* carry two and four cruise missiles, respectively.

At the present time, the limited range of the majority of Soviet diesel-powered submarines and Soviet naval aircraft appears to restrict most submarine operations to areas relatively close to the Soviet shores. In the west, this area is in the Norwegian Sea, and in the northeast Atlantic it represents the area south of Iceland and west of Ireland. Some extension of this area may be possible, but it would reduce the time on station significantly for both aircraft and submarines.

The longer range Z-class and F-class diesel submarines in the Northern Fleet have been known to operate as far from bases as Gibraltar,

* See Appendix C.

** This operational radius does not include replenishing at sea and is based on the assumption of 1 day on station.

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the Azores, the Western North Atlantic, the west coast of Africa, and perhaps most notably in the area east of the Bahamas during the Cuban crises. Some of these operations may have been independent, but others (for instance during the Cuban crises) are known to have been supported by auxiliary replenishment ships. In independent operations these submarines can considerably extend the range of operations against carrier groups; however, at present they comprise only about 15 percent of the total number of long-range submarines in the Soviet fleets.

Operation of Soviet nuclear submarines has not been reported in areas beyond the normal Norwegian Sea and Northeast Atlantic. Although it is possible that they were not detected or classified, it is believed that operations in this area were not conducted, because of the considerable amount of trouble the USSR has been reported as having with nuclear powerplants. These difficulties probably have greatly restricted the long-distance operations of these submarines. In view of the Soviet publicity given to the under-ice cruise of the nuclear-powered N-class submarine in 1962, it seems that these difficulties may now have been largely overcome so that more frequent long-distance patrols can be expected in the future. The Soviet naval exercise in the Atlantic in August 1960 [redacted] was alluded to by both Admirals Platonov and Lisytin as including an atomic submarine.

Although the Special Collection provides no details on the cruise missile that is launched from submarines, [redacted]

[redacted] has disclosed the existence of such a weapon, which has the US designation of SS-N-3. This missile has a range of about 300 nm at low supersonic speed at altitudes below 3,000 feet. It has an estimated nuclear-warhead yield of from [redacted] when used in an anti-ship role.* It has terminal homing guidance, but the principle of operation of this homing device is unknown. The submarine must be on the surface to launch this missile, and the E-class nuclear-powered submarine, which has six launchers, has been detected [redacted] as launching

* For use of this cruise missile against land targets, see p. 159, below.

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four missiles in pairs with a 5-minute interval between pairs. The only information concerning the method of target acquisition by the submarine for this system is that suggested by the following statement by Admiral Kasatonov:

The most crucial problem in organizing such a strike is providing the missile submarines with accurate data on the location and factors of movement of the enemy for calculating an aiming point which ensures the lock-on [zakhvat] of the enemy vessels by the homing system of the missile. With clear-cut organization of the control of submarines and aviation, this task can be accomplished by aviation carrying out a thorough reconnaissance [dorzavedka] of the enemy. Also exerting great influence on the success of the firing is the accuracy with which the submarines determine their own position; this can be ensured by the use of radio navigational instruments of high accuracy and by further improvement of the navigational instruments on submarines. 1, p. 18/

The "long-range" torpedoes with nuclear warheads mentioned in the Special Collection have not been identified in other intelligence. Analysis of information regarding Soviet atomic test series has indicated underwater explosions and has led to the estimate that the USSR has nuclear warheads for torpedoes, but no identification has been made of a "long-range" torpedo that is so equipped. [redacted]

G. Future Means for Combatting Attack Carrier Groups

That development of the means of combatting carrier groups is still going on is most clearly implied by Captain First Rank Mamayev in the following statement:

The devotion of proper attention to the independent naval operation will permit us to find the

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most effective methods for combat with the carrier attack forces, and to determine the direction along which forces and means must be developed to support the combat operations of submarines and naval aviation. 12, pp. 5, 6/

The new features of combat with carrier strike large units which have been examined are the result of the adoption into the armament of the navy of a new weapon and of its delivery-vehicles -- submarines and aircraft. Of course, by no means all the natural consequences of this have yet been brought to light. However, the time has come for a critical appraisal of everything which has been worked out in the past on the questions of combat with carrier large units. An attempt at this has been made in this article. 12, p. 22/

The important new means of combat that are mentioned for use against carrier groups and that apparently are under development or under consideration in the USSR are discussed below together with other pertinent intelligence.

The generally unanimous agreement among the naval authors that submarines and aircraft are the main forces to use against carrier groups and the obvious superiority of nuclear submarines, indicate that the most immediate future development will be the appearance of more atomic submarines. Other intelligence on Soviet construction of submarines indicates that at least three or four different classes of nuclear submarines are under construction in the USSR and that this program enjoys a high priority.

Although no mention was made of it by the naval authors, other intelligence has indicated the development of a new ASM with a range of about 400 nm, designated "Kitchen", that is launched from the medium-range, turbo-jet supersonic dash bomber designated Blinder.* This

* See Appendix C.

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weapons system is associated mainly with the Long Range Air Force, but there are some indications that it also is being deployed to naval air regiments. Regardless of its final subordination, it is possible that this weapons system will have an anticarrier capability. Because the Kitchen has been test fired since some time before July 1961, it may be expected to become operational soon.

Another possibility regarding the future development of naval aviation is suggested by the endorsement by both Bogolepov and Lisytin of the development of "naval strike missile aircraft, not wheeled aircraft which are entirely dependent on airfields but seaplanes." 4, p. 18/ Inasmuch as two new types of Soviet seaplanes (designated Mail and Mallow*) have appeared in recent years, it seems reasonable that a missile-armed seaplane also may be developed especially for naval air deployment.

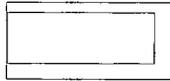
A development which may by now be nearing completion but which has not yet been firmly identified and accurately described by Western intelligence is the method and equipment whereby reconnaissance aircraft and submarines can provide cruise-missile submarines** with accurate data on the location and factors of movement of the enemy for the purposes of calculating an aiming point that ensures lock-on (zakhvat) of the enemy vessels by the homing system of the missile. In his first paper, published early in 1960, Admiral Kasatonov conjectured that this problem could be solved by a combination of aerial reconnaissance, the use of radio navigation systems of high accuracy, and further improvement of navigational instruments on submarines. He neglected to mention the means of communication between the reconnaissance vehicle and the missile-launching submarines or how the reconnaissance vehicle could determine the geographical location of the target with sufficient accuracy. [redacted]

[redacted] Because three classes of cruise-missile-launching

* See Appendix C.

** These submarines being up to 300 nm from prospective targets.

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submarines (the E-class nuclear-powered submarine and the "Twin Cylinder" and "Long Bin" conversions of the diesel-battery-powered W-class) have appeared since 1960 and because these programs are continuing, it seems reasonable to believe that the over-all fire control system for these units is operational or nearly so.

Another development possibly in the near future may be a considerable effort to broaden the scope and effectiveness of electronic countermeasures against carrier groups. Captain First Rank Mamayev stressed this point, as follows:

In the course of the first operation, an important part will be played by well-organized radio countermeasures covering all axes and wave bands, disrupting the stability of the enemy's control of his forces and his use of guided missile weapons. In the area of an operation it is necessary to achieve a kind of "supremacy in the ether," which, nowadays, in the age of missile weapons, is as important as the achievement of supremacy in the air was important and decisive in the last war. 12, p. 19/

The naval authors indicate that developments are either going forward or are being considered on atomic aircraft and on reconnaissance by earth satellites for use against carrier groups.

Admiral Bogolepov in his first paper, published in early 1960, discussed Soviet development of a nuclear-powered aircraft, as follows:

The Americans at the same time have been working strenuously in recent years on the creation of a nuclear powerplant for aircraft. There is no doubt that we have every possibility of outdistancing the USA in this connection. 2, p. 10/

On the other hand, especially great range and maximum speed ... are required for ocean going aircraft. It should not be said that the best way to

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fulfill both demands will be secured by a transfer to nuclear power, the introduction of which to aviation, however, should be given most serious attention. 2, p. 12/

Admiral Platonov, writing later, scoffed at the potential of atomic aircraft and stated:

Rear Admiral V. Bogolepov predicts a great future for atomic aviation in operations at sea. One should not give oneself up to illusions. Even though it may be too soon to argue about what the atomic engine will do for the airplane, it is still possible to say now with certainty that such a plane will be shot down by the weapons of anti-aircraft defense just like all its piston-engine and jet predecessors 5, p. 4/

In his second paper, published in May of 1962, Admiral Kasatonov refuted Platonov's evaluation, as follows:

It is also difficult to agree with the author [Platonov] of the article on the evaluation which he gives of the long-range possibilities of atomic aircraft.

Apparently, aircraft using atomic energy will be able to fly for quite a long time at low altitudes and at any distance from the airfields, and they will be shot down much less frequently by anti-aircraft weapons than were their piston and jet predecessors.

According to theory, the atomic airplane can become an almost invulnerable and quite effective weapon of armed combat on the sea in conducting combat operations against a carrier strike large unit, convoys, and missile-carrying submarines. 8, pp. 6, 7/

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Finally, Rear Admiral Bogolepov in his second paper, published in 1962, reiterated his belief in the desirability of atomic aircraft, as follows:

It will suffice for autonomous [atomic] aircraft to appear, to have the significance of aircraft carriers fall off sharply. 11, p. 12/

In his second paper, Bogolepov appeared to have lost some confidence in his earlier optimism about the Soviet ability to "outdistance" the US in developing an atomic aircraft. He wrote:

Because we also need these aircraft for other purposes, all efforts should be exerted toward its creation, the more so, because of other reasons, we cannot permit the Americans to outstrip us in this field. 11, p. 12/

+

In his recent speeches President Kennedy spoke coolly about atomic aircraft. Of course, for the USA and Britain which possess powerful aircraft carrier fleets, atomic aircraft are really unnecessary. But is not the USA simultaneously trying to confuse us with its announcements? 11, p. 13/

Taken together, these remarks by the naval authors indicate quite conclusively that atomic aircraft are a thing of the distant future. In fact, Bogolepov's remarks suggest that Soviet efforts to develop such an aircraft suffered a loss in priority between 1960 and 1962. These indications are in consonance with the lack of any other evidence of the existence of a high priority project for developing an atomic aircraft.

Although the naval authors of the Special Collection seem to agree that aircraft are the most useful reconnaissance vehicles, they do not neglect to point to the future potential of artificial earth satellites in this role. In 1960, Rear Admiral Bogolepov said:

Of course, the mission of reconnaissance now can also be accomplished by pilotless means. If one bears

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in mind the long-term possibilities in this connection of artificial earth satellites, which could systematically give a complete picture of movement on the oceans, then the conclusion follows that the speedy realization of that prospect should be worked at persistently. But if the discussion concerns the so-called reconnaissance missiles, then they, especially from submarines, may be launched only for tactical elaboration of an already known operational situation, and to effect reconnaissance of the latter is actually much simpler and more convenient with the aid of manned aircraft. 2, pp. 7, 8/

Captain Mamayev, in mid-1962, stated:

Apart from aerial reconnaissance, mobile targets in the ocean, such as are represented by a carrier attack force, can be successfully detected by space reconnaissance [kosmicheskaya razvedka]. The present state of development of missile construction and radio-electronics already presents a real possibility for reconnaissance of carrier strike large units with artificial satellites. As is shown by calculations, when photographing from a satellite at an altitude of 300 km, the image of an aircraft carrier on a photograph will be 0.7 mm in length (with a camera of a focal length of one meter). The necessary information on a carrier attack force can be obtained, after interpretation and enlargement of these photographs. A system of such artificial satellites will allow carrier strike large units to be detected at any point of the world's oceans and will provide the necessary time for an aircraft sortie and for the possible redeployment of submarines for the delivery of strikes against the enemy. 12, p. 11/

[redacted]
[redacted]
Future satellites providing electronic transmission of

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higher resolution photographs of the earth's surface could be a valuable supplement to aerial reconnaissance by reducing the required numbers of reconnaissance aircraft. A reconnaissance satellite system for detection or tracking of carrier groups, however, requires the resolving of interrelated problems such as frequency of coverage of a single area, resolution of transmitted data, and numbers of satellites simultaneously in orbit. Although the scanning and transmission techniques used by the current COSMOS vehicles might be used with a different optical system to provide near realtime reporting of higher resolution video data, there is no present evidence that such a system is in operation, in spite of the rather keen interest expressed in the above quotations. The fact that such a photographic system would have no current capability against submerged ballistic-missile submarines would be an important negative factor in any decision by the Soviet government to attempt its development.

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VI. Destruction of Polaris Submarines

Part of the principal task of the Soviet Navy to prevent a nuclear attack on the USSR is the destruction of Polaris submarines. Admiral Kharlamov, writing late in 1961, includes this as part of the basic and primary task of the Navy in the initial period of the war.*

The rapidly growing fleet of US Polaris submarines, the increasing range of Polaris missiles, and the extremely low vulnerability of this nuclear strike system have caused Soviet strategists to view this threat as extremely serious. They fully recognize the complexity and cost of developing defense systems to deal with this threat.

Rear Admiral Zhukovskiy, writing in October 1961, gave some insight into what then were Soviet views on the magnitude of the Polaris threat when he wrote:

The military leadership of the United States considers that in the next ten years atomic missile submarines will become one of the decisive means of combat at sea and will replace aircraft carriers as the main striking force of the navy. Therefore, the United States is devoting great attention to the construction of atomic submarines equipped with "Polaris" missiles. To allot the maximum possible amount of money for the construction of atomic submarines, the United States has abandoned the further construction of aircraft carriers for the time being.

Altogether, according to data from the foreign press, by 1970 the shipbuilding program of the United States envisages bringing the number of atomic missile submarines in the navy up to 45, and the number of antisubmarine submarines up to 100.

* See p. 62, above.

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At present, the missile atomic submarines of the US Navy are armed with type A-1 Polaris ballistic missiles with a range of 2,000 km and a nuclear warhead with a trotyl equivalent of [REDACTED]. Later they are expected to take on board for their armament A-2 and A-3 type Polaris missiles with ranges of 2,800 and 3,200 km and a warhead with a trotyl equivalent of [REDACTED].

According to data from the foreign press, experimental launchings of Polaris missiles from a submarine have shown that it is possible to use this weapon at a speed of 2 to 3 knots, from a depth of 30 meters, and with a sea state of not more than six balls, conducting the firing with an interval of 15 minutes between firings. Later on, it is proposed to increase the rate of firing, decreasing the interval between firings to 2 to 3 minutes. The accuracy of firing Polaris missiles from a submarine against ground targets with specified coordinates is sufficiently high. According to preliminary calculations, their average probable deviation from target at maximum range is [REDACTED].

According to the views of the military leadership of the United States, the use of missile submarines in a surprise nuclear attack should be sufficiently effective. The Pentagon believes that to achieve this effectiveness, up to two-thirds of all the missile atomic submarines must be constantly at sea.

At the present time, American atomic missile submarines continuously patrol in the Northeast Atlantic area in readiness to deliver nuclear/missile strikes against previously designated targets in the territory of our country, just as the bombers of the strategic aviation of the United States, with their load of atomic and hydrogen bombs, patrol in the air.

As a result of the ever-increasing importance of atomic missiles submarines in the plans of our probable

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enemy primarily in a surprise nuclear attack, combat against them must be considered one of the main missions of our navy. 9, pp. 2, 3, 4, and 5/

Preparing for an aggressive war against the USSR and the countries of the Socialist Camp, the military leadership of the United States began to devote great attention to the Arctic as a possible base of operations for a surprise nuclear attack. With this goal, the intensive study and mastery of the Arctic, primarily by atomic submarines, began. Thus, since October 1957, American atomic submarines have carried out a total of seven voyages, passing under the ice of the Central Arctic Basin by various routes. Considering the threat of the use of missile submarines from this axis, it is advisable to provide for the establishment of an anti-submarine defense in the Arctic areas. 9, p. 20/

As is generally known, since November 1960 one or two American missile submarines constantly patrol in the area of the Lofoten Islands near the coast of Norway. It should be expected that they can take up launch positions among the Norwegian fiords. 9, p. 21/

The task of countering Polaris submarines is a relatively new one for the Soviet Navy. Although Polaris submarines have been carrying out operational patrols only since 1960, * Admiral Kharlamov stated:

It is known that already in 1957, in connection with the accelerated construction by the United States

* Rear Admiral Zhukovskiy stated: "The atomic missile submarine George Washington arrived in the patrolling area for the first time on 24 November 1960 and returned to New London on 21 January 1961. This submarine carried out patrolling for the second time from 3 March 1961 to 27 April 1961. The atomic missile submarine Patrick Henry was on patrol from 28 December 1960 to 8 March 1961." 9, p. 5/

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of atomic submarines, armed with "Polaris" missiles, and the possibility of their being used from the ice areas of the Arctic, the Navy was assigned a new task. 10, p. 19/

A. Present Soviet Capability in ASW

The general impression conveyed by the several naval authors is that the strategy and means for combatting the Polaris force has not been fully developed. This impression is supported by the debate among the several naval authors as to the best means to accomplish this task. For example, Platonov, in early 1961 stated: "Strictly speaking, we do not yet have finalized methods for combating missile-carrying submarines. Even the main forces for accomplishing this mission have not been defined." 5, p. 6/ Lisytin, at about the same time, stated that ways of solving this new task are under investigation and that at present combat is generally limited to the coastal zone, as follows:

Combat against missile-carrying submarines presents a new problem. Ways of solving it are still under investigation. It is possible that in the future they will turn to some extent into combat between two of a kind [between submarines] under water.

The existing antisubmarine forces and weapons of the Navy, with the exception of submarines, can in fact carry on combat with enemy submarines only in the coastal zone. This is far from adequate. Antisubmarine forces, as the basic means of combat against the future main strike forces of the enemy Navy, have a great future, and special attention must be paid to their development. 4, p. 11/

Admiral Kharlamov, however, writing in December 1961, asserted that the statement of Admiral Platonov, quoted above, "is incorrect." He

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asserted, in a generally critical article that appeared in early 1962, that the situation was as follows:

It is known that already in 1957, in connection with the accelerated construction by the United States of atomic submarines, armed with "Polaris" missiles, and the possibility of their being used from the ice areas of the Arctic, the Navy was assigned a new task -- to prevent these submarines from delivering strikes against our territory. Special measures were taken for the most rapid construction of special antisubmarine defense forces, as well as for working out the use of this purpose of the forces and means which were already part of the equipment of the fleet.

The fleets and academies were assigned the task of giving special attention during operational and combat training, and while conducting scientific research, to finding effective methods of combat with missile submarines. As a result of this, at the present time a system of anti-submarine defense has been worked out, as well as opinions regarding the performance of its task. 10, p. 19/

Kharlamov's remarks are interpreted as indicating that a program for the development and construction of ASW submarines, ships, and aircraft was initiated about 1957-58. Nevertheless, intelligence on production of such forces indicates that only a small fraction of the quantity required has been produced to date. Although it may be true that "a system of antisubmarine defense has been worked out, as well as opinions regarding the performance of its tasks," as Kharlamov asserted, that statement is not regarded as reflecting the existence within the Soviet Navy of a present capability to cope with the difficult problem of Polaris submarines.

The naval authors, with the exception of Admiral Kharlamov, concede that the present Soviet capability to counter Polaris submarines

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successfully is low. In general, their remarks support Western intelligence estimates, which accord only a very limited ASW capability that is confined largely to their own coastal areas. It is estimated that several years will be required for the USSR to improve significantly its ASW posture beyond its own coastal areas.

B. Strategy and Means for Combatting Polaris Submarines

The naval authors view their task as one of destroying the missile launch platform -- the Polaris submarine. In October 1961, Zhukovskiy stated:

The density of the antisubmarine forces and means comprising the system of antisubmarine defense should correspond to the degree of threat of enemy submarine operations from various axes, and also with the capabilities of antimissile defense on these axes because the security of targets being defended is ensured by the destruction not only of the submarine-missile carriers, but also of the missiles themselves. 9, p. 10/

There is, however, no discussion among the naval authors about the destruction of the Polaris missile being a task of the Soviet Navy. Apparently there is a tacit understanding that this task is left to the ABM forces of the USSR.

The task of destroying the Polaris submarine is the most difficult problem the Soviet Navy has ever had to face. The problem has been complicated by a number of factors, such as:

1. The ocean and sea areas from which Polaris missiles may be launched is quite large.
2. The launch area for Polaris missiles is in the main off shores not controlled by the USSR and is considered by the USSR as being in the "far zone," where the Soviet surface forces either have not operated extensively or do not at all.

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3. Probably the most important factor is the difficulty of detecting a submerged submarine at sea.

A study of this task involves a study of the entire Soviet ASW effort, including detection technology, weapons, submarines, and surface and air forces.

1. Possible Soviet Strategic Plan for ASW

Rear Admiral Zhukovskiy, writing in late 1961, presented a comprehensive and detailed plan for conducting antisubmarine warfare in all its phases. The strategy proposed by Zhukovskiy has four main elements, as follows:

In our opinion, under modern conditions combat against submarines should envisage the following:

Destruction of the points of basing and construction of missile submarines, and also the destruction of the submarines at these points;

Searching out and destruction of missile submarines at the exits from bases, during sea passage, on the approaches to the launch positions, and in the area of launch positions [startovaya pozitsiya];

Frustrating and hampering the missile submarines in the use of their weapons;

Destruction of the forces and means of combat support of the missile submarines.
9, pp. 5, 6/

Zhukovskiy believed that about one-third of the total number of Polaris submarines could be destroyed at bases and that this task could be assigned to the "missile troops!" He stated:

As has already been indicated above, atomic missile submarines have as their

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basic mission the destruction of important coastal targets. Therefore, one can anticipate that while bound for launch positions to fire ballistic missiles they will avoid meeting any vessels so that they will not be detected prematurely. If it is taken into consideration that the launch positions and the routes of movement to them can be situated in vast spaces of ocean in areas where the operations of our antisubmarine forces are hampered, then the advisability of delivering strikes against points of basing and construction of missile submarines, to destroy the latter before they put out to sea, becomes evident.

However, it is necessary to keep in mind that the goals of combat against missile submarines cannot be achieved completely by means of strikes against bases and construction points, because a large portion of the enemy submarines (according to American views, up to two thirds of the effective strength) always will be at sea. Therefore, despite all the complexity of its organization and the large economic expenditures, direct combat against enemy submarines at sea continues to remain one of the main methods of combat against missile submarines, along with their annihilation at bases and the destruction of shipbuilding centers.

The missions of destroying missile submarines at bases and destroying naval bases, shipbuilding, and missile-building plants, and also other important industrial enterprises cooperating with these plants, can be assigned to the Missile Troops. It is obvious that the operations of the Missile Troops in fulfilling these missions differ in no way in principle

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from operations to annihilate or destroy other important targets; therefore, they are not being examined in the present article. 9, pp. 7, 8/

The Polaris submarine force at sea not only presents the greatest threat to the USSR but also presents the greatest problem in defense. Zhukovskiy stated that to accomplish this task, ASW forces at sea must be supported by a previously prepared and continuously operating ASW system in each sea theater. He continued:

With the present state of coastal missile weapons, the destruction of submarines at sea can be carried out only by the navy.

In view of the fact that it is difficult or even impossible to distinguish missile submarines from submarines of other types at sea, combat against them will develop into combat against all submarines. It must be waged in vast areas of oceans and seas, including even Arctic areas. This combat demands a considerable quantity of forces and vigorous exertion of them. To destroy a missile submarine at sea or bar the use of its missile weapons against important coastal targets, it is necessary to detect the submarine even before the approach to launch positions and to concentrate anti-submarine forces for its pursuit and destruction in the area of detection. Of course, it is difficult to carry out a mission of this sort by haphazard operations of special naval antisubmarine forces without advance equipping of the sea [ocean] theater of military operations with various antisubmarine means.

We believe that combat against submarines at sea can be successful when the use of antisubmarine forces is supported by a previously prepared and continuously operating system of antisubmarine defense in the theater.

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A continuously operating system of antisubmarine defense must be a set of measures for the special equipping of the theater and organizing the combat operations of naval forces directed toward combat against enemy submarines, and must include:

Stationary means and maneuvering forces used for antisubmarine observation and for warning about detected enemy submarines;

Mine and net barriers, restricting the penetration of submarines into defended areas;

Antisubmarine forces used for seeking and destroying submarines on antisubmarine lines and in open areas of the sea, and also the means to control them.

Taking into consideration the threat of delivery of surprise concentrated strikes by missile submarines of the probable enemy which are continuously at sea, it is advisable to create and use a system of antisubmarine defense, of necessity, even in peacetime, like the system of antiair defense of the country. 9, pp. 8, 9/

2. Basic Principles of Soviet Planning for ASW

Rear Admiral Zhukovskiy went on to propose specific basic principles that should be pursued in the development of an antisubmarine defense. He wrote:

In our opinion, the makeup of the system of antisubmarine defense must conform to the following basic principles:

- a. Antisubmarine defense in a theater should be created to a depth of not less than the firing range of ballistic missiles from enemy submarines against

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important operational-strategic objectives on the coast and in the depth of the territory of the country.

There is no doubt that the best system would be one operating within the limits of the entire theater right up to the exits from the points of basing of the enemy submarines. However, actual capabilities are inadequate to create such a complex system of antisubmarine defense over the entire expanse of the seas and oceans. Therefore, we speak of a depth of not less than the range of fire of the ballistic missiles as the necessary minimum. On various axes of the theater, it is necessary to determine the depth of the antisubmarine defense on the basis of the military-geographic conditions, the location of objectives being defended, the degree of threat from enemy missile submarines, and the capabilities and performance characteristics [taktiko-tekhnicheskoye svoystvo] of the antisubmarine forces and means.

b. Antisubmarine defense in a theater should be echeloned; this is achieved by the organization on separate axes of a series of successive operations of antisubmarine forces on several lines [in several zones].

This principle is necessitated by the impossibility of reliably accomplishing the mission of search and destruction of enemy submarines on one line and is directed toward the achievement of higher probabilities of destruction of enemy submarines.

c. The density of the antisubmarine forces and means comprising the system of antisubmarine defense should correspond to the degree of threat of enemy submarine operations from various axes, and also

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with the capabilities of antimissile defense on these axes because the security of targets being defended is ensured by the destruction not only of the submarine-missile carriers, but also of the missiles themselves.

This principle conforms with the requirement of the optimum of the system of antisubmarine defense, i. e., the achievement of its maximum effectiveness, defined as the greatest probability of destruction of enemy submarines and the least damage inflicted on our coastal targets through the efficient disposition of antisubmarine stationary facilities and maneuvering forces in a theater.

d. Antisubmarine defense in a theater should possess high combat stability and constant readiness to repel a surprise attack of enemy submarines.

This is especially important for the initial period of a war, when the enemy will try to use simultaneously all of the strike forces of his fleet which have been deployed at sea beforehand to wage a nuclear attack.

The system of antisubmarine defense should be tied in with the reconnaissance and the patrol service and with the organization of observation in the theater as a whole, and also with the antiaircraft [antimissile] defense of the country. 9, pp. 9, 10/

The employment of forces to search for and destroy submarines at sea, Zhukovskiy suggests, should be organized into "near and far zones of antisubmarine defense." He added:

In accordance with possibilities for using various types of weapons by enemy submarines and the performance characteristics of antisubmarine forces and means, the search for and destruction of submarines at sea is organized into near and far zones of antisubmarine defense.

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It is accepted practice to consider that the near zone of the antisubmarine defense will be established in the coastal part of a sea. The basic mission of antisubmarine forces operating in the near zone is to defend its lines of communication, vessels and ships at bases and points of dispersal, and coastal installations against action by enemy submarines.

The search for and destruction of submarines in the near zone is carried out by antisubmarine surface vessels, aircraft, and helicopters. Fixed antisubmarine means are also widely used for combating submarines in the near zone.

The far zone of the antisubmarine defense includes the water space from the outer limit of the near zone of the antisubmarine defense to the maximum possible distance away of the launching line for ballistic missiles from enemy submarines against the most important targets on the coast and in the depth of the territory of the country. The basic mission of the antisubmarine forces operating in the far zone of the antisubmarine defense is to bar strikes by enemy missile submarines against coastal installations.

The search for and destruction of missile submarines in the far zone of the antisubmarine defense is carried out by antisubmarine submarines, aircraft, helicopters, and surface vessels. 9, p. 11/

A further basic principle proposed by Zhukovskiy is that of joint operation in ASW. This principle has long been a guiding one in the US Navy, and the appreciation of this principle is shown in Zhukovskiy's following statement:

The basic principle of the use of the antisubmarine forces to destroy enemy submarines at sea

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is their joint operations, which make it possible to carry out combat missions more effectively. Joint operations can be carried out by groupings of antisubmarine forces with the following possible combinations of heterogeneous forces of the fleet:

Antisubmarine submarines and airplanes [helicopters];

Antisubmarine airplanes [helicopters] and surface vessels;

Antisubmarine submarines and surface vessels;

Antisubmarine submarines, airplanes [helicopters] and surface vessels.

Coordination between antisubmarine submarines and antisubmarine aviation and also between antisubmarine submarines and surface vessels consists of agreement upon time and location of search for enemy submarines carried out by these forces independently within the limits of assigned lines [areas]. Coordination is achieved through direction, by the combat fleet command post of the commander of the fleet, of antisubmarine aviation or surface vessels against enemy submarines detected and not destroyed by our antisubmarine submarines and through the designation of demarcation zones between areas of operations of various forces.

Coordination between antisubmarine aviation and surface vessels consists of agreement upon time and place of search efforts and attacks against enemy submarines carried out by vessels and airplanes [helicopters] independently or jointly.

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Coordination is achieved through direct mutual direction of vessels and airplanes and determination of the sequence of attack during joint operations or through direction of hunter-killer groups against enemy submarines by the combat fleet command post of the commander of the fleet during independent operations. Direction of vessels against detected submarines by airplanes can be carried out by radio information [radioinformatsiya] methods, radio homing [radioprivod], leading [lidirovaniye], and with the aid of visual signals. Direction of airplanes against detected submarines by vessels is carried out by issuing information on their own location and the bearing and range of the submarine. 9, pp. 18, 19/

Zhukovskiy concluded his basic concepts for combatting Polaris submarines by including the destruction of communication and control centers and the disruption of the electronic navigation systems which serve them. He stated:

Combat against enemy missile submarines does not amount only to operations for the direct destruction of the submarines themselves, the carriers of missile weapons. It is also necessary to strive for the creation of conditions which hamper the control of the submarines and their use of their weapons. This can be achieved by the following:

Destroying the coastal control points of the submarines, the transmitting and receiving radio centers with the goal of making it difficult for the enemy to control his submarines at sea;

Destroying or putting out of operation coastal systems of radio navigation and destroying satellite [sputnikovyy] systems of navigation to make

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it difficult for enemy submarines to determine their position at sea and thus reduce the accuracy of their firing of ballistic missiles;

Radiocountermeasures [radioprotivodeystviye] against systems of control of missile weapons, radio navigation systems, and communications installations. 9, pp. 19, 20/

Zhukovskiy summarized his article for the Special Collection with the following conclusions:

a. Combat against enemy missile submarines is an intricate complex of combat operations and measures carried out not only by the navy but also by the armed forces of the country as a whole.

b. Successful combat against missile submarines at sea requires the creation of special highly effective antisubmarine forces and means and the use of them in a quantity which ensures high probabilities of destruction of enemy submarines.

c. Despite the over-all complexity of combat against enemy missile submarines at sea, it can be sufficiently successful if there are the following: a system of antisubmarine defense previously deployed during peacetime, high combat readiness of anti-submarines forces, and mobile use of them during combat operations. 9, p. 22/

C. Fixed Hydroacoustics Stations in Submarine Detection

The subject of "fixed hydroacoustic stations" is mentioned by five of the naval authors. For example, Zvyagin stated, "The hunt for enemy missile submarines by ships of the PLO [ASW forces] can be carried out with the aid of fixed hydroacoustic observation systems." 6, p. 13/ Zhukovskiy mentioned "stationary means of observation" as a means of

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initially detecting submarines. 9, p. 8, 17/ Discussing the detection of submarines in the coastal zone -- out to several hundred kilometers --, * Bogolepov stated, "If this mission is assigned to fixed means (which at present can work only on the basis of hydroacoustics) having good communication with the shore, then detected submarines could be destroyed from the shore under conditions in which this will not disrupt the system of detection." 2, p. 5/ He also mentioned "coastal [pribrezhnaya] zones saturated with technical shore surveillance systems." 2, p. 4/ Zhukovskiy stated: "Fixed antisubmarine systems are widely used for combating submarines in the coastal zone." 9, p. 11/

Referring to ASW operations in the Arctic, Lisytin stated: "An automated system of lines of radio-hydroacoustic stations and cable-hydrophone lines set up on the ice can significantly facilitate the detection of submarines in conditions of ice." 4, p. 10/ Zhukovskiy also mentioned "cable-connected hydrophone lines" and "ice hydroacoustic stations" for use in the Arctic. 9, p. 21/ However, Panteleyev in discussing that system said:

We do not deny, of course, the possibility of the submarine forces detecting enemy submarines through the use of technical equipment installed on the ice surface or in the water through holes cut into the ice. But in view of the great mobility and hummocking of Arctic ice and of the vulnerability of these technical means from the air, it should be taken into consideration that these technical means will be used only occasionally. Therefore, they would not be the principal basis on which the reliability of an entire submarine operation is planned. 7, p. 12/

The Soviet geographical disadvantage in developing a fixed, peacetime ASW early warning system is alluded to Lisytin, who stated:

As positional means (that is, fixed stations) for detecting and destroying submarines cannot be set

* According to Bogolepov, the width of this zone is growing continually as technology develops.

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up in peacetime in neutral waters, reliance should not be placed on their wide use in the initial period of war." 4, p. 9/ Bogolepov, in his statement that "detection and destruction of submarines outside the coastal zone by some type of fixed or shore means is impracticable," expressed a view of the rather limited usefulness of fixed systems. 2, p. 6/

Zhukovskiy advocated the "laying of barriers of moored radio hydroacoustic buoys set out in lines perpendicular to the probable axis of movement of enemy submarines." 9, p. 17/ Because he suggested the laying of these buoys by "hunter-killer groups of ASW aircraft," they could not be very large, nor is this a likely peacetime tactic in waters not controlled by the USSR.

The specific nature of the "fixed hydroacoustic stations" or "stationary means of detection" referred to by the naval authors is difficult to determine. Only along the Pacific Ocean coastline, in the Sea of Japan, and in the Black Sea does the Soviet geographical position permit the installation of shore-based, bottom-laid hydrophone system similar to the US SOSUS system for long-range detection of submarines. A system having limited capabilities might be installed in the sea area off the Kola Inlet in the Barents Sea. Such systems must be laid in the deep sound channel, to which the USSR has access only in those two areas. Available intelligence indicates that the USSR probably is engaged in developing such systems, but there are no positive indications that any are operational. Concerning the form that such "stations" might take in other areas, an interesting drawing of a large buoy apparatus in the recent Soviet book, Sonic and Ultra-Sonic Waves, by V. A. Krasil'nikov, published in 1960. The Soviet "stations" could well be one of these large automated moored buoys which, by the use of a suspended hydrophone and a radio transmitter, is actually shown detecting a submarine and transmitting a corresponding message to the shore. These large sonobuoys could be moored in coastal areas or in seas that are nominally under Soviet control -- the Barents Sea and other seas along the northern and eastern periphery of the USSR. Channel buoys and old mine cases of Soviet origin have been found with sonobuoy equipment inside. These devices may have been prototypes of what is referred to by the naval authors as "fixed" or "moored" hydroacoustic stations.

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An unusual variant of this scheme was alluded to by Panteleyev in his remark concerning "technical equipment for submarine detection, installed by special mine-laying submarines under the ice (buoys for detecting enemy submarines, mine obstacles and nets)."

Evidence is available of Soviet research and development activities indicating that the USSR may be developing a hydroacoustic surveillance system in the Arctic. More recent information indicates that Soviet research and development is continuing in the Arctic on underwater sound, geophysical measurements, and probably on radiowave propagation, underwater weapons, and detection systems. A detection system based on hydrophones suspended beneath the ice, as proposed by Lisutin and Zhukovskiy, is considered to be feasible. [REDACTED]

The use of the words "could" and "can" by the naval authors in discussing fixed hydroacoustic stations strongly suggests that the USSR did not have any complete systems in actual operation in 1961.* It is clear, however, both from the frequent mention of "fixed" and "positional" stations and from other sources of intelligence, that the USSR is interested in such stations and could deploy them in the Arctic and in other Soviet-controlled waters in the near future.

D. Role of Antisubmarine Submarines in ASW

All the naval authors, with the exception of Bogolepov (who addressed himself principally to the role of aircraft), stress the importance of the antisubmarine submarine. Zvyagin wrote of "special subs of the antisubmarine defense," and Kasatonov mentioned "hydroacoustic patrol submarines," and added, "atomic submarines must destroy every enemy submarine detected." 6, p. 3/ 1, p. 11/. Platonov stated flatly:

Antisubmarine submarines equipped with
the most improved sonar and hydroacoustic

* Although the USSR probably has a number of fixed, bottom-laid hydroacoustic listening stations in operation, they appear to be intended only for the local defense of harbors and naval bases, and probably have a rather limited range.

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equipment can be the only real forces for combating missile-carrying submarines. Underwater sonar search, underwater patrolling, and underwater patrols and ambushes must become their tactical methods. Active combating of missile-carrying submarines and all maneuvering connected with hunting and destroying them must now be carried on deeply underwater instead of on the surface. There is no other way. 5, p. 7/

Admiral Platonov, writing in early 1961, stated that the construction of ASW submarines is not being sufficiently emphasized and that greater emphasis is being placed on the "type" of submarine that was being developed for combating attack carrier groups, to interdict ocean communications lines, and to be used against "objectives on the enemy coast". He stated:

New technology and new weapons deservedly raise atomic submarines to the level of the main forces. With equal success, these submarines are capable of combating the main enemy nuclear weapons delivery vehicles -- the aircraft carrier attack large units -- and of operating against the ocean communications lines and against objectives on the enemy coast. Therefore, it is understandable that primary attention has now been given to the construction of exactly this type of vessel. Considering that the existing danger from enemy missile-carrying submarines is no less serious than from aircraft carriers, the bearers of nuclear weapons, it seems to us that the same degree of attention should also be given to the construction of submarines for antisubmarine defense. However, that is not how matters stand here. Judging by information in the naval press [Morskoy sbornik, special issue, 1960, p. 4], the construction of this only real means for combating atomic submarines carrying

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Polaris missiles is placed in the same rank with the construction of anti-aircraft defense vessels, landing vessels, and minesweepers. 5, p. 15/

Platonov warned, however: "In the construction of forces it is detrimental to be carried away by vessels of narrowly assigned purpose" Therefore, it is necessary to strive for good designs [pro"yekt] of a universal submarine capable of accomplishing both attack missions and antisubmarine defense missions 5, p. 16/ It is possible that the Soviet nuclear-powered N-class submarine, which is believed to be in serial production and of which probably 10 had been completed by the end of 1962, combines the best attack and antisubmarine features presently available to Soviet shipbuilders.

Rear Admiral Lisyutin, writing in late 1960, stated:

Combat against missile-carrying submarines can be conducted most successfully by antisubmarine submarines 4, p. 10/

Pantelèyev, writing later in mid-1961, agreed with Lisyutin and pointed up the necessity for organizing submarine squadrons, as follows:

In the near future only enemy submarines will be able to counteract the deployment of our submarines. And only our submarine forces, organized into submarine squadrons and carrying out submarine operations, can counteract this formidable force [missile-carrying submarines] of the enemy. 7, p. 10/

Zhukovskiy also cited the desirability of antisubmarine submarines in ASW warfare, as follows:

Antisubmarine submarines possess a number of positive characteristics: a considerable operating radius, great endurance, and the capability to operate under ice cover. The antisubmarine submarines have means to detect enemy submarines and antisubmarine weapons to destroy them.

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Such characteristics of atomic antisubmarine submarines as range of operation, endurance, and the capability of sailing under ice are practically unlimited and will depend mainly on the physical condition and morale of the crew and also on the presence of equipment for regeneration of the air. The range of operation and endurance of diesel-electric submarines are determined by fuel supplies, and their endurance and range of sailing under ice are determined by the capacity of their storage batteries.

The possibility of antisubmarine submarines choosing sailing depth and low-noise speeds in a favorable hydrologic relationship contributes to more effective use of the hydroacoustic equipment for observation through the water medium and detection of submarines. 9, pp. 11, 12/

Admiral Kasatonov, in his second article of October 1961 (although basically critical of the earlier article by Admiral Platonov) seemed to agree with Platonov about the value of antisubmarine submarines but warned that they should not be considered as the only weapon. He wrote:

We basically agree with the opinion of Admiral V. Platonov about the degree of threat from enemy missile-carrying submarines and on the ways of combating them at the modern stage of the development of our antisubmarine defense forces and weapons. It is true that at the present time the real strength in the fight against missile-carrying submarines can be fast submarines of the anti-submarine defense which are specially equipped to accomplish this task. There is also no doubt about the methods of combat operations of anti-submarine submarines proposed in the article.

However, one cannot completely agree with the author of the article when he says that there

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is no other way to combat missile-carrying submarines. In our opinion, the use of a single weapon (the submarines of the antisubmarine defense) in the struggle against such a formidable enemy as missile-carrying submarines is an emergency measure caused by the status and capabilities of the antisubmarine forces and weapons at the given moment.

Although possessing several indisputable advantages in comparison with other forces of the antisubmarine defense, the submarines of the antisubmarine defense also have their shortcomings. The chief shortcoming is that even with the sharp increase in the range of detection of submarines by hydroacoustic means of surveillance, detailing submarines of the antisubmarine defense for the reliable accomplishment of this task must be excessively large and must amount to not tens but hundreds of atomic submarines. This, obviously, cannot be guaranteed for a comparatively long time. Moreover, having predominance in the world ocean in surface and air forces, the probable enemy can use, in his fight against our submarines, besides his own submarines of the antisubmarine defense, surface ships, dirigibles, and aircraft of the antisubmarine defense from land bases and from aircraft carriers. This will place our submarines of the antisubmarine defense in an unequal position with the enemy submarines, and this even further decreases the reliability of accomplishing the task of combating them. 8, pp. 7, 8/

Zhukovskiy suggested an important special role for Soviet ASW submarines, as follows:

Beyond the limits of the zone covered by an antisubmarine defense system, destruction of enemy submarines at sea must be carried out by our submarines deployed on approaches to

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the bases of enemy submarines, in remote areas of the sea, at exits from straits, and also on probable routes of movement of enemy submarines to launch positions. 9, p. 15/

The matter of ASW weapons to be used by Soviet submarines received only slight attention by the naval authors. Admiral Kasatonov in October 1961 referred to "missiles with nuclear charges launched from submarines" as an effective means. He wrote:

In our opinion, the essence of the problem is to create effective means for the distant detection of submarines from the air which will make it possible to employ for their destruction the most effective modern means of destruction -- missiles with nuclear charges launched from submarines or aircraft and possibly also from shore launching mounts. 8, p. 9/

Kasatonov, in an earlier article of about mid-1960, referred to forces required for closed sea theater operation wherein submarines with nuclear and conventional "torpedoes of different designation" are listed. 1, p. 17/ The "torpedoes of different designations" are believed to include ASW torpedoes.

Zhukovskiy, in late 1961, stated: "The antisubmarine submarines have means to detect enemy submarines and antisubmarine weapons to destroy them." 9, p. 12/

The impression gained from the statements by the naval authors is that the antisubmarine submarine, particularly nuclear-powered, is a powerful ASW weapon and in some cases the only weapon that can be used. However, the limitation of submarines to conduct ocean search quickly over vast ocean areas leads to the consideration of additional means for ASW.

The absence of any specific mention of an ASW weapon similar to the US Navy's rocket-boosted SUBROC is considered significant and may indicate that the USSR envisions neither the early attainment of

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such a weapon nor the early achievement of the very-long-range submarine sonar equipment necessary for detecting and tracking hostile submarines at a range exceeding that of conventional ASW torpedoes. However, unidentified new types of ASW weapons, possibly having a partially airborne trajectory, are under development.

E. Role of Aircraft in ASW

It is regarded as significant that the only naval author to write specifically on the role of naval aviation, Rear Admiral Bogolepov, in mid-1960, did not make a strong case for the use of aircraft in ASW operation beyond the "coastal zone". He wrote:

Concerning combat with submarines, in this zone [coastal zone] the solution to the question depends on the method selected by us for detecting them But if the search and location of submarines is done by mobile forces, then these, naturally, will have the mission of destruction. As is known, the leading place among these forces belongs to aircraft, including helicopters. 2, p. 5/

It must be added that if the operational range of shore missile weapons is superior to the range of shore technical means of surveillance and target designation, then in this "external" part of the offshore zone the significance of aviation will grow still more as a result of the assignment to it of the mission of surveillance [reconnaissance], target designation, and, when needed, guidance.

We shall turn to an appraisal of possible methods of operations against mobile enemy objectives located outside the offshore zone just examined. If one speaks of enemy submarines, then, naturally, detection and destruction of them outside the offshore zone by some type of fixed or shore means is impracticable, and may be accomplished only by surface and air forces.

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If one speaks of surface ocean objectives, then elementary calculations show that the destruction of them from the land, although possible, demands such cumbersome missiles and such a complicated system of target designation and guidance that in an overwhelming majority of cases it is much more profitable to destroy them with missiles from mobile, specifically "intervening", carriers. Which carriers in this realm are most advantageous -- submarine, surface, or air?

As is known, we have set aside surface ocean forces as a result of a number of considerations. Therefore, the discussion may proceed solely with submarine or air forces.

Unfortunately, the requisite comprehensive examination of this question does not yet exist. Preliminary calculations permit one to assert that the most advantageous carrier of weapons at sea is indeed aviation. 2, pp. 5, 6/

In regard to aviation for coastal waters, it can manage without special range, although for some classes of aircraft, for example, reconnaissance aircraft, antisubmarine and antiaircraft defense aircraft guarding convoys, greater range would be useful. To the extent that this is "our zone" and we must always have air superiority here, especially high speed for these aircraft is not required, the main need is for excellent means of surveillance (including detection of submarines) and weapons. 2, p. 12/

Regarding long-range aircraft, Bogolepov stated:

On the other hand, especially great range and maximum speed (now not less than 1,800 to 2,000 kilometers per hour) in order to have the capability

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of evading an air enemy with superior forces are required for ocean-going aircraft. It should not be said that the best way to fulfill both demands will be secured by a transfer to nuclear power, the introduction of which to aviation, however, should be given most serious attention. 2, p. 12/

Lisyutin, on the other hand, advocated late in 1960 the use of long-range seaplanes for ASW without specifying any of their detailed characteristics, as follows:

Accomplishing the mission of detecting submarines in the extensive areas of seas and oceans demands an excessively large expenditure of existing forces and weapons, which calls for the creation of new means permitting the surveillance of extensive water areas in short periods of time. In this respect, the greatest capabilities are possessed by long-range seaplanes making use of small sonobuoys, and also by antisubmarine vessels carrying antisubmarine helicopters. 4, p. 10/

Pertinent statements concerning the use of long-range ASW aircraft also were made by both Kasatonov and Zhukovskiy. In October 1961, the former commenting on Platonov's earlier article, stated:

We do not share the very pessimistic evaluation expressed by Admiral Platonov regarding naval aviation. It is obvious that, provided the means of detecting submarines by aircraft are improved, and the flight range of aircraft at low altitudes is increased, aircraft will be able to increase the effectiveness of the struggle against missile-carrying submarines in coordination with ASW submarines. 8, p. 8/

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Zhukovskiy, also in October 1961, evaluated the potentialities of aircraft for ASW, as follows:

Antisubmarine aviation, having available modern airplanes and helicopters of long and short range, magnetometric and radio hydroacoustic means of observation through the water medium, and with special types of antisubmarine weapons, is capable of waging effective combat against submarines at sea.

The favorable characteristics of antisubmarine aviation are: (1) The capability of searching, in short periods of time, large spaces of sea to the entire extent of possible use of missiles from submarines by the enemy; (2) high readiness for operations and the capability of arriving in areas where submarines might be located in the shortest time; (3) the potential for quickly concentrating the necessary number of airplanes and helicopters on the required axis of operations.

The shortcomings of antisubmarine aviation, hampering its combat use, include the following: dependence on meteorological conditions and the status of airfield basing; the relatively low endurance of airplanes [helicopters]; limited potential for carrying out combat operations in Arctic areas. 9, p. 13/

Zhukovskiy further stated quite precisely his conception of the tactical use of aircraft in ASW, as follows:*

The basic method of operations of antisubmarine aviation for the destruction of enemy submarines

* The phrase "special charge" in the quotation probably is a reference to a nuclear warhead.

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is active search by groups of antisubmarine airplanes, either independently or on the basis of information of initial detection of submarines by other arms of forces or from stationary means of observation.

Operating independently in assigned areas or on lines, hunter-killer groups of antisubmarine aviation carry out the following: the laying of barriers of moored sonobuoys, set out in lines perpendicular to the probable axis of movement of enemy submarines; the laying in open areas of sea of drifting sonobuoys in the form of a zone of dense coverage (several parallel lines, in a circle or in a spiral), with the calculation of obtaining contact with a submarine at any point in the area of its assumed location; the laying of drifting radio hydroacoustic buoys in lines covering an area subject to search, with simultaneous search in the area with the aid of sonar lowered into the water by helicopters or of serial MAD equipment.

In accomplishing the mission of search and destruction of submarines on the basis of data of initial detection by other forces, it is most advisable to lay intersecting barriers of several parallel lines of drifting sonobuoys in the sector of possible courses of submarines detected earlier.

To reduce enemy counteraction against anti-submarine aviation, it is essential to choose, when possible, areas of its operation and flight routes to these areas which are outside the zone of operation of enemy fighter aviation. After detecting enemy submarines, aviation hunter-killer groups attack them, using antisubmarine aerial bombs with a special charge or antisubmarine aerial

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torpedoes to destroy the submarines. Airplanes which have not discharged their weapon loads or antisubmarine surface vessels located in the waiting areas are directed against the undestroyed submarines. 9, p. 17/

Despite the previously cited remarks concerning the desirability of equipping surface vessels with helicopters, Platonov, in speaking of hunter-killer antisubmarine groups composed of aircraft and surface vessels, says: "Helicopters, with their insignificant radius of operations and their inability to fly over the sea in poor visibility, at night, and in bad weather, will be completely useless." 5, p. 7/ Unfortunately, however, it is not clear whether he was speaking of land-based or shipborne helicopters.

Zvyagin, however, made the following very interesting remarks concerning a new type of helicopter-carrying surface ship:

It is necessary to use helicopter-carrying vessels for locating submarines in distant and open water areas. However, since helicopters have a limited load-lifting capacity and range of operations, they can be fitted only with equipment for finding submarines within a comparatively short range from the parent vessels. As for the destruction of submarines, the solution of this task presents well-known difficulties for helicopters, since they are incapable of carrying the necessary torpedoes or bombs. For this reason, it will be necessary in the near future to use helicopters together with antisubmarine vessels which are capable of carrying large supplies of submarine destruction weapons for long periods of time. 6, p. 13/

The foregoing statements strongly suggest that the USSR will employ both long-range and short-range aircraft in ASW. New developments in this direction already have been observed in intelligence. The

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new turboprop seaplane (Mail), displayed in 1961 at the Tushino Air Show and obviously equipped with magnetic anomaly detection (MAD) gear, is clearly designed specifically for ASW. This aircraft is estimated to have a combat radius of 900 nm and an endurance of about 12 hours while conducting an ASW mission at an altitude of 1,500 feet. The USSR, nevertheless, may intend to use that aircraft for coastal ASW, in much the same manner as existing reciprocating-engine seaplanes have been used. Any of the recent transport aircraft of Ilyushin or Antonov design could be converted readily to long-range ASW aircraft. Nevertheless, the absence of any clear assertion in Bogolepov's article that conventional long-range naval aircraft can detect submarines effectively (they are vulnerable to enemy fighter aircraft, he says) contrasts sharply to the more optimistic (but perhaps less expert) view of the other admirals. Much would seem to depend on the development of improved airborne detection equipment. In this connection, Bogolepov's statement that "the main need is for excellent means of surveillance" may be significant. The actual Soviet plan for the use of long-range aircraft in ASW apparently remained undecided as of 1961.

Observations at the Tushino Air Show indicate that the USSR has continued the development of twin coaxial rotor helicopters that are especially suitable for shipborne operations. Some Soviet destroyers already have helicopter platforms. In spite of the statements concerning helicopters for surface ships presented in this section and in the previous section, and the fact that the USSR has had considerable interest in the use of shipborne helicopters, observations of Soviet exercises indicate that little progress has been made in their use. Zvyagin's advocacy of an apparently larger type of helicopter-carrying surface vessel is especially interesting.

In support of Zhukovskiy's reference to "antisubmarine aerial bombs with a special charge," intelligence on Soviet nuclear tests shows that there have been several underwater detonations. In support of his statement about "antisubmarine aerial torpedoes," recent intelligence shows that the USSR is modifying an existing antisurface ship aerial torpedo, possibly for ASW use.

Zhukovskiy's mention of "sonar lowered into the water by helicopters" is in agreement with a previous report that "dipping sonar" has been under development by the Soviet Navy and probably will soon become operational. It is known that some Soviet ASW helicopters already are equipped with MAD equipment, as also mentioned by Zhukovskiy.

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F. Role of Surface Ships in ASW

The naval authors are clearly aware of the deficiencies of surface vessels for use in antisubmarine warfare. Rear Admiral Zvyagin, writing in early 1961, was the only author who discussed the problem in detail. "In many cases," said Zvyagin, "present-day surface vessels will not be able to emerge victorious from an engagement with submarines. Their capacity to effectively search, pursue and destroy, or sometimes even to escape from nuclear submarines, is very limited." 6, p. 6/ The manner in which the USSR has attempted to remedy this weakness is clear from the following statement by Zvyagin: "These circumstances made it necessary to equip surface vessels with antisubmarine helicopters which may help to make up the deficiencies of surface vessels in their combat with missile-equipped nuclear submarines." 6, p. 22/

Describing the manner in which he believed that the surface vessel could be improved to the point where it could play an important role in ASW, Zvyagin stated: "When surface ships are equipped with anti-aircraft missiles and helicopters, their potential in combating submarines will become even greater." 6, p. 3/ He envisions the following rules for ASW surface vessels:

The composition of the Navy must include special vessels of two basic classes for anti-submarine warfare against enemy submarines; vessels for short-range operations, and vessels for long-range operation. Both classes must have modern hydroacoustical equipment, powerful antisubmarine weapons, anti-aircraft missile weapons, and antisubmarine helicopters. With such aids they will be able to carry out long-range searches and destroy enemy submarines. 6, p. 4/

He later defines "long range" as including the whole of the launching area of Polaris submarines, as follows:

The use of surface vessels in combat against enemy missile submarines will consist of search

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for and destruction of those submarines, mainly within the boundaries of the possible firing positions for submarines approaching the coast to strike targets situated in the depth of our territory. The use of surface vessels in the outer zone of antisubmarine defense will be limited because of the difficulty in the matter of their support.

Taking into account the disposition of a series of objectives and the capabilities of enemy missile submarines, one can assume that the probable areas of their firing positions will be (540 to 1600 kilometers) from the coast. In these areas, combat against enemy submarines will be carried out primarily by long-range antisubmarine vessels resolving missions in coordination with antisubmarine aircraft and submarines, utilizing the systems of antisubmarine surveillance available in the theater of operations. 6, p. 11/

Zhukovskiy, writing in October 1961, pointed out some strengths and weaknesses of surface vessels in performing various important ASW functions, in the following remarks:

Surface antisubmarine vessels also have a number of favorable characteristics enabling them to wage combat against submarines both in near and far zones of the antisubmarine defense. Among such characteristics are the following: large sailing ranges and endurance; the capability of carrying out the search and pursuit of submarines under difficult hydrometeorological conditions; the availability of powerful antisubmarine weapons which, because of their weights and sizes, cannot be used by other arms of the forces; and the opportunity to establish well-equipped command posts making it possible to control the heterogeneous antisubmarine forces directly at sea.

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However, the combat use of antisubmarine surface vessels is hampered by a number of shortcomings. These shortcomings are: first of all, low combat capabilities to repel air attacks, and this makes it necessary to protect in a special way their stay at sea; less range of hydroacoustic detection in comparison with the hydroacoustic sets of submarines, and this reduces the effectiveness of their search for submarines; and little concealment of the operations of antisubmarine surface vessels from enemy reconnaissance, and this facilitates the selection of axes of movement for submarines breaking through.

9, p. 12/

The other naval authors made only brief references to the use of surface ships in ASW. These statements, however, generally agreed with Zvyagin. Lisytin, for example, stated that surface antisubmarine vessels armed with anti-aircraft missiles, could considerably extend their zone of operations. 4, p. 10/ This view also is supported by Platonov, who called for a "corvette [destroyer-escort] with equally powerful PVO [anti-aircraft] and PLO [antisubmarine] weapons." 5, p. 16/

Intelligence on the Soviet destroyer program indicates that these ships are being developed generally along the lines suggested by the naval authors in that improvements in effectiveness for ASW seem to predominate. Admiral Zvyagin's view may well reflect actual Soviet policy. There are indications that a large destroyer which may have ASW as its principal mission probably is in the production stage. Two new classes of destroyers (Kynda and Kashin)* a new escort (Project No. 35), and two new smaller vessels have appeared in operation, all of which are fitted with ASW weapons.

Zvyagin appears to have explained the purpose of helicopter platforms on all Krupnyy-class guided-missile destroyers and also on a few Kotlin-class destroyers. Evidently the helicopter is intended largely

* See Appendix C.

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for ASW, although it also could provide assistance in spotting targets for the surface-to-surface cruise missiles with which the Kildin-class, Krupnyy-class, and Kynda-class are equipped.

The recent appearance of surface-to-air missiles on the new Kashin-class and Kynda-class destroyers, on the new escort (Project No. 35), and on a greatly modified Kotlin-class destroyer confirms the view expressed by several of the naval authors that such an armament is desirable.

Ships with equally powerful anti-aircraft and ASW armament were specifically advocated by Platonov, and the desirability of such also was stated by Lisutin and Zvyagin. In several respects, the new Kashin-class destroyer appears to meet this specification, and the new escort under construction in the USSR could well be a ship of that type.

On the basis of both the admirals' statements and available intelligence, it appears ASW surface vessels will continue to be built, but their configuration and armament probably will differ radically from previous types of Soviet destroyers and subchasers. Evidently the future of the ASW surface ship is dependent on the installation of missiles to defend them against aircraft and the development of superior equipment to detect and destroy submarines.

G. Indications of Technological Gaps Affecting the Soviet ASW Capability

1. Need for Improved Sonar

Although sonar is one of the principal factors in ASW, the most forceful statement concerning the need for better sonar equipment was made not in an ASW context but in the context of offensive submarine operations against US lines of communication (anticonvoy operations). Platonov, in early 1961, made the following statement:

An important and still unresolved problem in combat operations on the lines of communication is the question of the attacking submarines obtaining

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accurate data on the movements of the target. The gap between the means of target indication, paralyzed to a virtual standstill, and the technology of submarine construction, which has moved far forward, existed even earlier and is constantly increasing. The submarine long ago became capable of firing from underwater, but in order to obtain firing data it must come to the surface as before or must approach submerged to within risky distances of the enemy. Such use of new large atomic submarines is intolerable. Without waiting for the time when accurate data on the location of the enemy may be obtained by means of artificial earth satellites, our scientific research establishments must take steps at once to eliminate this lag, which was permitted to develop, and achieve an increase in the distance of underwater observations [nablyudeniye] and in the accuracy of underwater direction finding [pelengovaniye]. 5, p. 9/

Because of Platonov's statement that "antisubmarine submarines equipped with the most improved sonar and hydroacoustic equipment can be the only real forces for combating missile submarines," it is logical to expect that the USSR will make a special effort in this area. 5, p. 7/ Pantel'ev's reference to "reconnaissance submarines with powerful hydroacoustic equipment" also suggests a need for improved sonar. Pantel'ev, in mid-1961, stressed the importance of underwater electronic devices to undersea warfare in general (which he envisioned as the principal type of naval warfare in the future) in the following statement:

With the development of the means of underwater television, sonar, and communications, the control of a submarine squadron becomes possible and submarine battles and engagements with all their underwater aspects -- reconnaissance, deployment, strikes against protective forces and against the main target -- assume realistic forms. 7, p. 8/

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It has previously been estimated that the USSR lags behind the US in the development of sonar equipment and underwater electronic devices. Whether for offensive or defensive application, there is little doubt that the USSR is emphasizing the development of new sonar and underwater communications equipment. Underwater TV of limited range is presently in use on the oceanographic research submarine Severyanka.

2. Improved Airborne Detection Systems

As mentioned above, Bogolepov stated that, with respect to the operation of naval aircraft in the coastal zone, "the main need is for excellent means of surveillance (including detection of submarines) and weapons." 2, p. 12/

Kasatonov, in his second article, also lays great emphasis on the development of an improved airborne detection system, as follows:

In our opinion, the essence of the problem is to create effective means for the distant detection of submarines from the air which will make it possible to employ for their destruction the most effective modern means of destruction -- missiles with nuclear charges launched from submarines or aircraft and possibly also from shore launching mounts.

It would be incorrect to rule out the possibility of creating other means of detection. Considering the great seriousness of the threat of missile-carrying submarines for our country and the other countries of the Socialist Camp in the event a war breaks out, we must set such a task before Soviet scientists. 8, p. 9/

Presumably these are references to improved MAD gear. The possibility is that infrared or some other advanced technique also exists because of the necessity for assigning Soviet scientists to the problem.

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Lisyutin, too, voiced this need in an allusion to the creation of a new means for permitting the surveillance of extensive water areas in a short period of time and pointed out at the same time the capabilities possessed by long-range seaplanes making use of small sonar buoys, as follows:

Maneuvering antisubmarine forces could be concentrated without hindrance before the beginning of combat operations on the lines of operations of missile-carrying submarines, and after detecting the submarines they could maintain hydroacoustic contact with them until an order for using weapons is received or until they make their first attempt to launch missiles.

Accomplishing the mission of detecting submarines in the extensive areas of seas and oceans demands an excessively large expenditure of existing forces and weapons, which calls for the creation of new means permitting the surveillance of extensive water areas in short periods of time. In this respect, the greatest capabilities are possessed by long-range seaplanes making use of small sonar buoys, and also by antisubmarine vessels carrying antisubmarine helicopters. 4, p. 10/

Thus it appears that the USSR will emphasize the development of airborne detection systems, for which they feel a critical need.

3. Aids to Submarine Navigation in the Arctic

Some of the naval authors clearly envision the Arctic as a major theater of naval operations in the future. The problems of anti-submarine warfare in the Arctic are treated in considerable detail by Panteleyev, who indicated that a positive need exists for aids to submarine navigation in that area and proposes several specific systems, as follows:

During the conduct of submarine operations it is absolutely necessary that each submarine

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know its place in the formation and its place in relation to the bottom of the ocean or sea and to the nearest banks and islands, first of all for security of navigation; as well as for the tasks of tactical deployment and placement of technical means of combat (buoys, mines, nets). One of the most important navigational aids for helping submarines determine their position must be a well-made naval chart showing depths of the Arctic basin and a series of other important data (underwater currents, the steepness and unevenness of the bottom, as well as its characteristics). Such a "submarine" chart should be in the making now and should be periodically updated with new data (areas of sound channels and other hydrological elements) for the most detailed portrayal of the entire underwater environment. However, the availability of even the most detailed charts cannot guarantee that there will be an exact pinpointing of the submarine's position. A question arises concerning the creation of underwater hydroacoustic beacons for submarines, concealed from the enemy and operating when triggered by our submarines. Theoretically, the creation of such a beacon, operating on the basis of a coded format, also presents no problem. 7, p. 11/

The USSR has conducted extensive research in the oceanographic, hydrographic, and hydroacoustic characteristics of the Arctic region in recent years and is possibly about to install a hydroacoustic detection system there. That Panteleyev (a knowledgeable man) does not mention an inertial navigation system for submarines, which the USSR presumably is capable of developing, may indicate serious Soviet limitations in this field. Perhaps he believed that the high latitudes pose too difficult a problem for gyroscopes. His proposal for "underwater acoustic beacons" is an important and valuable one for facilitating

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under-ice navigation, and his reference to a "coded format" of transmissions by these beacons possibly is an allusion to the use of "pseudorandom noise," an advanced technique in naval hydroacoustics.

4. Electronic Data Processing for the Control of Naval Operations

Kasatonov, in speaking of naval operations in closed sea theaters, stated that "the special complexity of this situation . . . urgently requires all possible automation of the control of naval forces, above all, the automation of the collection and processing of information." 1, p. 25/ This is an important concept in modern naval warfare that is especially applicable to the complex operational problem of detecting, identifying, and destroying enemy submarines by means of ASW submarines, ships, and aircraft. It is noteworthy that Kasatonov, who is now Commander of the Northern Fleet, the most important operational command in the Soviet Navy, states a Soviet requirement for rapid data processing in the control of naval forces.

Captain First Rank Mamayev, writing in mid-1962, although discussing the need for automation in carrying out attacks against NATO's attack carrier groups, implied that automation was lacking in naval services generally.*

H. Advanced or Novel Concepts Proposed for Use in ASW

1. Shore-Launched Weapon for Destroying Submarines in the Coastal Zones

In describing the conduct of ASW in the coastal zone, Bogolepov, late in 1960, stated:

If this mission is assigned to fixed means (which at present can work only on the basis of hydroacoustics) having good communication with

* See p. 59, above.

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shore, then detected submarines could be destroyed from the shore under conditions in which this will not disrupt the system of detection. 2, p. 5/

This statement, which unfortunately is not amplified elsewhere, would seem to imply either a shore-controlled minefield (possibly including self-propelled mines), or a shore-launched surface-to-underwater type of missile having a range out to the boundary of the coastal zone (several hundred kilometers), equipped with terminal acoustic homing. This latter would appear to be a feasible weapons system provided accurate tracking information on the submarine's position is available. It would be, essentially, a long-range weapon of the ASROC type. Target tracking would not be easy, but might be accomplished by means of the above-mentioned automated system of "radio-hydroacoustic stations" or by the "technical shore surveillance systems" with which the coastal zone could be "saturated." 2, p. 4/

Kasatonov, in his second article, made a passing reference to the same weapons system in his statement that submarines can be destroyed "possibly also from shore launching mounts." 8, p. 8/

On the other hand, Zhukovskiy stated, "With the present state of coastal missile weapons, the destruction of submarines at sea can be carried out only by the Navy." 9, p. 8/ Although somewhat vague, the statement implies that shore-based ASW missiles are rather futuristic.

It cannot be said with any certainty that the USSR is developing the surface-to-underwater missile. However, the USSR almost certainly has operational coastal defense, anti-surface-ship missiles guarding the sea approaches to its main naval bases. It would appear that the most critical aspect of a shore-launched ASW weapon would be its target acquisition and tracking system. There are as yet no specific indications concerning the development of such a system, although it can be hypothesized, that the "radio-acoustic buoys" could play an essential role.

[] Scientific Research Institute
"NORD" at Baku, which is developing new naval weapons systems (including

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underwater weapons), [] sent a model to the Central Aerohydrodynamics Institute for wind-tunnel testing in 1959. Because a wind tunnel test also can be useful in the development of a constantly submerged weapon such as a torpedo, this [] does not conclusively indicate an airborne weapon. There also is a new and unknown type of naval weapon currently undergoing operational testing in the Krasnovodsk area of the Caspian Sea.

Although there is evidence concerning the development of a hydroacoustic surveillance system for the Arctic, the ice cover in that region presumably would prevent the destruction of submarines by shore-launched missiles, unless they were detected in a relatively ice-free area.

2. Detection of a Submarine Missile Firing by Means of the Trail of Ionized Gases

This novel concept is proposed by Zvyagin for operational use, as follows:

The hunt for enemy submarines can be carried out by groups of surface vessels with special equipment enabling them to detect the position of a submarine by the column of ionized gases at the moment of launching of the ballistic missile. These vessels must have long-range antisubmarine missiles in order to be able to destroy the submarine. The groups of vessels set aside for a hunt by the method stated will be deployed in the areas assigned to them in such a way that they can effect an overlap of detection along the entire zone of possible firing positions of the enemy submarines. The distance between groups of vessels must be such that a detected submarine can be destroyed by antisubmarine missiles at any point of the observed area. The operations of vessels conducting a submarine hunt based on detection of the column of ionized exhaust gases of the missiles will be carried on in coordination with shore installations established for the same purpose. 6, p. 13/

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The "special equipment" probably is radar to detect launching by backscatter return, or infrared. No judgment has as yet been made concerning the feasibility of this concept. Although it would not prevent the firing of at least one missile by the submarines, it could, if effective, significantly reduce the over-all weight of attack from missile-launching submarines.

3. Helicopter-Carrying Surface Ship

Zvyagin at one point stated; "It will be necessary in the near future to use helicopters together with antisubmarine vessels which are capable of carrying large supplies of submarine destruction weapons for long periods of time" suggests that the Soviet Navy desires to have a helicopter-carrying surface ship of considerable endurance and weapons-carrying capacity. 6, p. 13/ Such a vessel might resemble a small aircraft carrier, which, although not new to the US Navy, would be an innovation for the USSR.

4. Use of Merchant and Fishing Vessels in ASW

Zhukovskiy, writing late in 1961, recognizing that the ASW program of the USSR in the open ocean must be carried out largely from mobile platforms in the area, indicated that nonnaval vessels should be used to augment the naval forces, as follows:

It is advisable to carry out combat operations to destroy enemy submarines at sea, particularly in the initial period of war, by enlisting the maximum possible quantity of anti-submarine forces and facilities of the fleet and also the ships and aviation of the maritime fleet, the fishing industry, and the Chief Directorate of the Northern Sea Route, which are capable of carrying out observation of enemy submarines. In the period preceding the initiation of combat operations, all of the forces mentioned should be deployed in the zone covered by the system of antisubmarine defense in the theater, beyond the limits of this zone on the

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approaches to the points of basing of the submarines of the probable enemy, and on the routes of their movement into areas of combat operations. 9, p. 14/

This statement takes on additional significance in view of the fact that the USSR has developed a new and relatively powerful fish-finding sonar for installation in trawlers. This sonar will detect any submarines lying within its effective range, which under ideal conditions might be as much as 3 miles. An [] exercise in the Far East involving merchant and fishing vessels with naval shore stations in August 1962 suggests that this concept is being implemented.

5. Long-Range Antisubmarine Missile

Zvyagin also mentioned the necessity of a long-range anti-submarine missile.* Such a weapon would destroy a submarine after it had fired a missile and the resulting ionized trail of gases had revealed its position. On the basis of Zvyagin's description of this weapons system, the missile to which he is referring would have a range much greater than that of the conventional ahead-thrown rockets now in use in the Soviet Navy. It would be essentially a long-range weapon of the ASROC type. A new weapon is therefore implied.

A possible reference to such a weapon was made by Zhukovskiy in his potentially significant remark that one of the favorable characteristics of ASW surface vessels is "the availability of powerful ASW weapons which, because of their weights and sizes, cannot be used by other arms of the forces." 9, p. 12/ This statement clearly indicates a weapon more powerful and of longer range than that of the ahead-thrown rockets currently in use by the Soviet Navy.

6. Use of Earth Satellites in ASW

Kasatonov, in his second article, speaking of the need for improved airborne detection and weapons systems, says: "Apparently,

* See p. 146, above.

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the new possibilities in accomplishing this important task may take into account orbital means of combat which are based upon the use of artificial earth satellites." 8, p. 9/

This concept is well beyond the capabilities of science and technology at the present time, if intended as a system for detecting and destroying submerged submarines.

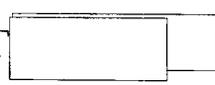
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VII. Destruction of Land Targets on Enemy Territory

The determination of Soviet policy concerning this task has presented the most difficult problem of all in analyzing the Special Collection. The difficulty arises because other intelligence reveals the existence of a growing force of Soviet submarines armed with short-range missiles and the existence of a Soviet program for the development of a longer range submarine-launched ballistic-missile system. The authors of the Special Collection, on the other hand, do not emphasize the desirability of this weapons system nor do they discuss its use in detail. Indeed, a cursory reading of the documents could lead to the conclusion that the task of destroying land targets has been taken away from the Soviet Navy. A more careful reading, however, in the light of the other intelligence, leads to the interpretation set forth below.

The policy for using naval forces to destroy land targets apparently has not yet been resolved. It is known that the USSR possesses submarines capable of launching both ballistic missiles and cruise missiles but whether or not the land targets more properly should be assigned to the Strategic Rocket Forces or the Navy is still being debated.

As mentioned earlier, Admiral Platonov stated that sometime before May 1961, ballistic-missile submarines had been freed from the task of conducting strikes against deep enemy objectives.* His statement seems to imply that although this decision was made at a high level, he believed such a step was premature. It is believed that Admiral Tributs, writing in October 1960, may have referred to this or a similar decision when he stated: "Therefore, the simplification and narrowing of the missions of the Navy which are going on are premature and completely unjustified measures." 3, p. 9/ In light of the range of submarine-launched missiles at that time and the debate that followed, these statements might indicate that Soviet submarines had been relieved of participating with the Strategic Rocket Forces in strikes deep in enemy

* See p. 53, above.

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territory but that these submarines still retained the task of striking at shore installations that support naval forces. The debate in the Special Collection is largely about whether or not land-based ship-support facilities should be a target for the Navy or of the Strategic Rocket Forces. From the point of view of combat targeting the Soviet naval authors seem to separate land-based naval support activities into two groups: (a) those facilities that support the naval nuclear strike capability of NATO, specifically berthing areas, communication centers, electronic detection stations and radio/navigational aids supporting the attack carrier groups and Polaris submarines; and (b) those facilities that support supply and communication lines, including commercial ports. Targets in the first category are believed to be considered by the naval authors as being a significant part of the task of combatting the naval nuclear strike capability of NATO but secondary in importance to countering attack carrier groups and Polaris submarines at sea. They believe that targets in the first category should be programmed during the initial period of the war, whereas targets of the second category may be programmed after the initial phase.

Although none of the naval authors sets forth clearly the role of ballistic-missile submarines, it is believed that Admiral Kharlomov, in December 1961, came nearer to stating the policy in effect at that time than any other writer. He wrote:

At the time that large units of missile troops, while delivering strikes against vital objectives on enemy territory, including ports and naval bases, also are destroying the ships located therein, the navy will engage in combat with carrier strike large units, enemy missile submarines and their supporting forces directly at sea, destroy aircraft carriers, missile-carrying vessels and atomic submarines in the areas of their combat operations and on the approaches to them. Part of the naval forces will deliver strikes against the basing areas of the antisubmarine forces, airfields of antisubmarine defense aviation, communications centers, control centers and the more important means of radiotechnical surveillance and navigation in the sea theater. 10, p. 9/

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Admiral Kasatonov, writing early in 1960 on the use of naval forces in a closed sea theater, made some significant statements regarding range of missiles and the possible multipurpose use of cruise missiles, as follows:

It is becoming entirely obvious that even at the current stage the most important missions will be accomplished by strike forces of the Navy with missile and nuclear armament. We have in mind, first of all, submarines armed with cruise [krylataya] and ballistic missiles

The situation changed with the introduction of nuclear-missile weapons into the armament of the Navy. For strikes against points of basing and clusters of vessels detected in anchorages, missiles from submarines and the launching installations of coastal missile units of the Navy can be used, independently and in coordination with units and large units of the operational [operativnaya] missiles of the ground forces. The submarines can deliver strikes from firing positions located in a closed sea at distances of 400 to 500 kilometers, and the coastal missile units, from firing positions on the seacoast

It is advisable to have in the composition of a fleet in a closed sea theater, submarines armed, not with ballistic missiles, but with cruise missiles, assuring the possibility of multipurpose use of the same submarines

In using cruise missiles, it is necessary to allow for the fact that because of their low flight altitudes their use for strikes against objectives remote from the seacoast is limited by the nature of the local topography. Specifically, the altitude of the terrain in the zone of flight of cruise missiles must not exceed 200 to 300 meters above sea level. In this respect, coastal missile units of the Navy are more limited in the selection of possible directions and distances of fire than submarines, which can select the most advantageous direction of fire by changing the launching position. On the other hand, submarines are inferior to coastal missile units in accuracy of fire, since the error in determination of the location of the submarine is added to the dispersion

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of the missiles. In closed seas, with the existing means of supporting the navigation of submarines, this error in location may amount to one to four kilometers. Considering these circumstances, it is necessary to use ballistic missiles for the destruction of objectives more remote from the coast, and cruise missiles for the destruction of coastal objectives. 1, pp. 2, 7, 8, 9, 22, 23/

Admiral Tributs, writing in October 1960, stated:

The destruction of various coastal objectives, including naval bases and ports, and also the destruction of enemy vessel forces located in them, will be executed by naval forces, both independently, and jointly with the missile troops. 3, p. 10/

Rear Admiral Lisytin, writing in January 1961, emphasized the potential of ballistic-missile submarines to complement the "missile troops" and stated that the use of these capabilities of the Navy requires further study, as follows:

The arming of our submarines with ballistic missiles with nuclear warheads makes them a very effective weapon in the accomplishment of the mission of disorganizing the enemy's economy and destroying his means of nuclear attack. It is true that in some respects submarines armed with ballistic missiles are inferior to surface-to-surface ballistic missile installations (lower accuracy of fire, reduced readiness in view of the necessity to deploy and take up firing positions, etc.), but they also have important advantages.

While surface-to-surface missile installations cannot fire a significant number of salvos in present-day conditions from the same position without suffering retaliatory action, a submarine, especially in launching missiles when submerged, can successfully make use of its whole unit of fire of missiles from one position, remaining under way all the time.

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Possessing high maneuverability and concealment, a missile-carrying submarine will, in the initial period of war, prove to be the least vulnerable and most stable combat means, capable of delivering sudden and powerful nuclear strikes in important directions.

In modern conditions all ground means are vulnerable to effective action from enemy nuclear weapons. Moreover, if they are not destroyed, they will be in the zone of radioactive contamination, which will reduce considerably their combat effectiveness. On the other hand, a missile-carrying submarine, being under water, is not vulnerable to radioactive contamination, and can always bypass dangerous zones.

Missile-carrying submarines, being least vulnerable to a sudden missile/nuclear attack by the enemy, can become a special weapon in the hands of the Supreme High Command.

Thus, the Navy possesses important operational-combat capabilities and advantageously complements the missile troops of strategic designation in the accomplishment of the most important strategic missions with which the armed forces are faced. However, the methods of using these capabilities of the Navy and the methods of conducting naval operations require, in our opinion, further serious elaboration. 4, pp. 5, 6/

Admiral Panteleyev, writing in July 1961 on the possible tasks and potential of submarines, stated:

This is, of course, far from a complete list of all of the missions which could be assigned to the navy and, especially, to its submarine forces. To this should be added the contribution of missiles fired by submarines against naval bases, shipbuilding yards, and other enemy military installations located on shore and in the zone of interior of the enemy country; also, missions involving

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coordinated action with troops of our maritime front by landing forces in the enemy's rear. However, it appears to us that while these missions can be assigned to our submarine forces today, in the future they can be accomplished with equal success by missile units and long-range aviation. In the resolution of these missions, strategic missiles will completely replace submarine forces, but nothing can replace submarine forces in their battle under the ice and in the depths of the oceans and seas against enemy missile-carrying submarines, his submarine transports, and his aircraft carrier strike large units. Therefore, the question arises as to whether it would not be better to orient our submarine forces in the future chiefly toward those types of operations, the execution of which depends entirely upon them, and in which a missile (ballistic or from an aircraft) cannot at present, replace a submarine? Without exception, every type and arm of the armed forces must first of all execute those missions which it has been designated to accomplish and which no one else can accomplish. 7, p. 17/

Admiral Panteleyev cites the potential for hitting targets in the interior of the enemy country and raises the question as to which forces, missile troops or submarines, should be assigned this task. Moreover, he seems to stress that submarine forces should first be developed for combat and directed against enemy strike forces at sea.

He goes on further to point out the hazards of operating submarines within 500 to 600 nm of the enemy's shore and introduces economic considerations apparently to support the policy for assigning certain targets to the Strategic Rocket Forces. Admiral Panteleyev seems to believe that if submarines again are to be assigned the task of deep strikes, the submarine forces should be organized in a new manner for this task. He wrote:

The approach of our missile submarines to the enemy shore to carry out a missile salvo will always entail their entry into the enemy antisubmarine defense zone; therefore,

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if the salvo is carried out from a distance, outside the anti-submarine defense zone, from an area of complete security (more than 500 to 600 miles from shore), then is it not better in such a case to use the ballistic missiles of the Missile Troops or to use Long Range Aviation? For the ocean-going atomic missile submarine is a very expensive weapon; it not only carries expensive equipment, but large groups of highly qualified specialists are on board. There is no one on a strategic missile and the results will be the same, and perhaps even greater, than from a missile fired from a submarine. Why risk an expensive submarine weapon and its entire crew in such a poor cause?

If, nevertheless, our submarine fleet will be assigned the mission of destroying enemy shore and rear area installations, in this case the submarine forces must be organized in a new manner.

In no way by our discussions are we preparing to deprecate the significance of missile strikes from submarines against enemy naval bases or other of his installations. We are discussing only the selection of the most effective, economical, and reliable weapon for the accomplishment of a given mission. It appears to us that with the development and perfection of strategic missiles, missions for the destruction of shore installations by submarines will be eliminated. 7, pp. 18, 19/

In contrast to the apparent belief by Panteleyev that submarines are best used for purposes other than the task of deep strikes, Rear Admiral Bogolepov, a senior Soviet naval officer who is believed to be quite knowledgeable in military-economic matters and operations analysis, presented a strong argument in favor of using submarines instead of ICBM's; thus suggesting at least that the removing from the Navy of a primary mission for deep strikes by submarines still is a point of controversy. He stated:

Therefore, the question is what is more "profitable": to destroy all these objectives with land-based missiles or those from "intervening" [promezhutochnyy] missile

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carriers-submarines, surface, or air? Even elementary calculations show that a uniform solution to this question in all cases is impossible: Under varied conditions it is advantageous to use varied forces and weapons.

However, in a number of cases, depending on the distances; on the nature of the antiaircraft and antimissile defense of the enemy, and on other elements of the situation, the use of "intervening" carriers may be fully warranted, partly because of the feasibility of simplifying construction and decreasing the size, weight, and hence, the cost of the missiles, partly because of their great accuracy of hit at lesser distances from the target, partly because mobile "intervening" carriers are less vulnerable to the enemy's missiles than fixed land-based launching installations, partly because these carriers may be needed anyway for performing other missions, and finally, as a result of the necessity for the enemy to expend weapons in these cases to combat the missiles and their carriers.

If one takes as a unit the military-economic cost of destroying in the initial period of a war not less than 15 to 20 percent of an enemy industrial area measuring 60 by 20 kilometers by intercontinental ballistic missiles with nuclear warheads, then with regard to all the conditions enumerated, as well as the probable losses, the cost of accomplishing this mission by atomic submarines will be approximately the same; by diesel submarines, twice as much; by cruise missiles from land bases, three times as much; and by aircraft, several times more expensive. The expenditures of the enemy to counteract these strikes will be: for operations against missiles, 6 or 7 corresponding units; against aircraft, about 15; and against submarines, 20 to 30 units.*

* Rear Admiral Bogolepov footnoted this comparative cost analysis by saying, "An exposition of the methodology of these calculations requires a separate place."

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Undoubtedly, these calculations, in view of their extraordinary importance, must be verified repeatedly and be defined more precisely for the most diverse conditions, for depending on the situation, it will be advantageous to use one or another method of delivering missiles to the target.

If one speaks of "intervening" carriers, then it is very clear that it will be more expedient to use aircraft in case of relative weakness of the anti-aircraft defense and to use submarines in case of relative weakness of the enemy's antisubmarine defense.

Thus, one may conclude that in operations against enemy shore installations the role of aviation under modern conditions is rather modest, although in some cases it is not ruled out. It is more advantageous to use land-based and submarine missiles against such installations. 2, pp. 3, 4/

The USSR has a limited capability to conduct strikes against land targets from both ballistic and cruise-missile submarines. The nuclear-powered H-class, the diesel-powered G and Z classes of ballistic-missile submarines, and the nuclear-powered E-class cruise-missile submarines are capable of operating independently off the coast of the US. The two classes of the converted diesel-propelled W-class -- the Twin Cylinder and Long Bin -- are limited in range and therefore are limited to targets in the peripheral areas of the northern Eurasian continents. Up through 1962, operational submarine-launched ballistic missiles (SS-N-4) probably had a maximum range of 350 nm with a [REDACTED] nuclear warhead. Operational submarine-launched cruise missiles (SS-N-3) probably have a range of 300 nm* with a [REDACTED] nuclear warhead when used against land targets. Operational exercises of the Soviet Navy in the Norwegian Sea possibly have included ballistic-missile submarines, but there is no evidence that ballistic or cruise missile submarines have patrolled off the shores of the US. Because of the short range of the current ballistic-missile available for use from submarines

* Analysis of recent test firings of this missile indicates that it can be flown to a maximum range of 450 nm.

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and because the naval authors view the NATO forces at sea as the greatest threat, it is possible that these submarines may have as one of their primary tasks in the initial period of a war torpedo attacks against NATO's naval nuclear strike forces and as a secondary task that of striking shore targets with ballistic missiles. The cruise-missile submarines are viewed as having an antiship role as their primary task.

In spite of the unclear picture regarding target designations for Soviet ballistic-missile submarines, [REDACTED]

a major advance has been made in submarine-launched ballistic missiles. These events confirm a continuing program of research and development for substantially improving the capability of the Soviet Navy and in particular that of missile-launching submarines. [REDACTED]

[REDACTED] major advances have been made in at least the following two areas:

1. The capability of a successful launch of a ballistic missile from a totally submerged submarine. Heretofore, Soviet naval ballistic missiles have been launched from a surfaced position.

2. Increased range of missile to about 650 nm. This increase over the previous range of 350 nm provides greater stand-off capability and meets the objective of Admiral Panteleyev wherein he estimated the effective depth of the enemy's antisubmarine defense zone to be about 500 to 600 nm.

Possibly complementary to the foregoing developments is the fact that since 1959 there has existed a program for constructing a class of large nuclear-powered submarines, the armament for which has not yet been determined. At least one of these submarines should have been completed during 1962; however, there is insufficient evidence on which to base a firm statement that it has been completed. The coincidence of the tests of longer range missiles, the exhibition of a new naval missile in recent parades in Moscow, and the existence of a large new class of submarines under construction leads to the speculation that an entirely new submarine-launched ballistic-missile system is about to appear.

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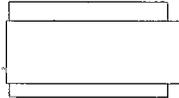
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On the basis of all the foregoing evidence, it appears that the role of Soviet missile submarines against land targets has been under review by the Soviet supreme high command. The result of this review is not now discernible; consequently, the future assignment of land targets to naval forces and the future development of missiles and submarines to accomplish this assignment cannot be predicted with accuracy. At present, the USSR has more than 30 diesel-powered G-class submarines* and about 10 nuclear-powered H-class submarines, each of which is equipped to fire 3 ballistic missiles having a maximum range of about 350 nm from a surfaced position. In view, however, of the observed development of a longer range, ballistic missile to be fired from a submerged submarine, it would appear at the very least that some of the existing submarines of the G or H classes probably will be refitted with an improved weapon having a range of at least 650 nm.

* See Appendix C.

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VIII. Interdicting Supply and Communications Lines of the Enemy

The task of interdicting supply and communications lines of the enemy in case of war has been a task of importance to the Soviet Navy since shortly after World War II. It was apparent to the USSR that the potential enemy was across the seas on the North American continent and that any action by the USSR against the countries of West Europe would certainly invoke US support.

Much debate is focused on this task -- largely on the timing of strikes, on where the communication lines should be hit, and on the methods to be used. The general consensus seems to be that this task is not one of primary importance in the initial period of a war.

Rear Admiral Bogolepov, in December 1961, wrote:

The question of combat against communication lines ... has been studied the most. However even here there is insufficient clarity in the point that was just emphasized: with what weapons is it more advantageous to destroy ports and bases - missiles from submarine or intercontinental missiles? And in conditions of nuclear warfare ports are the main objective in combat against communications lines. 11, pp. 8, 9/

Rear Admiral Lisutin, in January 1961, stated that this task was not an urgent one during the initial period of the war, as follows:

The probable enemy, intending to carry on an aggressive war against the countries of the Socialist Camp across the ocean and not relying in holding the bridgeheads now occupied by him on the Eurasian continent, will inevitably attempt to make major landings in order to seize new bridgeheads or to reestablish the situation on them, and also to undertake sea shipping in order to supply the groupings established in these areas. 4, p. 11/

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The disruption of sea and ocean communication lines cannot, in our view, be an urgent task immediately on the outbreak of a war, for the enemy apparently counts on ensuring accomplishment of the missions of the initial stage of a war by laying in supplies in advance at the planned bridgeheads. Some time is also required for the organization of communication lines. The forming of convoys and their movements from ports in the US to Western-European ports will take two to three weeks. 4, p. 16/

Admiral Kharlomov, in December 1961, generally supported the view of Rear Admiral Lisytin, as follows:

There is no need to argue the point that the destruction of the main strike groupings of enemy naval forces will facilitate the operations of our naval forces against the ocean communication lines of the enemy. The issue lies elsewhere -- should combat against enemy communication lines be carried out simultaneously with the operations to destroy the main strike forces of the enemy navy; will it be justified to allot for this purpose a considerable portion of the forces to the detriment of the accomplishment of the main task of the initial period of the war -- frustrating the enemy nuclear attack from the sea.

There is no doubt that the disruption of ocean communication lines and interruption of enemy sea transport will have considerable bearing on the course of combat operations in all theaters, but the effect will not be felt immediately; it will become evident gradually, as the materiel prepared by the enemy in advance becomes expended and his armed forces begin to suffer seriously from lack of ammunition, fuel, materiel and personnel. It will take at least several months before such a situation is reached, i. e., after the first operations have already been completed.

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Our probable opponents are amassing the required supplies of materiel in the theaters of military operations at a rate which, taking losses into account, will ensure the conduct of combat operations for a period of 3 to 4 months.

Due consideration must also be given to the fact that at the present time certain changes are taking place in the thinking of probable opponent regarding the system of protecting his sea and ocean communication lines. Aware of the fact that ocean and sea ports will become targets for nuclear strikes in the initial period of a war, the NATO military command now considers that one of the priority tasks in the initial period of a war is the withdrawal of their merchant ships from the areas of nuclear strikes in order to preserve them for carrying out heavy shipments in the subsequent period of the war.

This task was executed in practice at the strategic command-staff exercise of the NATO Armed Forces, "Side Step, " in 1960.

Such operations of the enemy corroborate once more that in the initial period of a war major movements of troops and freight from U. S. ports to the European Theater of War are not very likely.

Also, although the destruction of the transports while they are in process of evacuation will decrease the enemy's capabilities to organize subsequent sea shipments, it will have no direct influence on the course of combat operations in the naval and ground theaters in the initial period of a war.

Although the task of disrupting sea communication lines and frustrating enemy sea transport is one of the main tasks of the Navy in the initial period of a war, it must be executed, in full scope, only after the nuclear/ missile power of the enemy strike groupings has been

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undermined considerably, and his forces have lost the capability to deliver concentrated strikes against our Navy and its basing areas as well as against the rear area installations of our country. 10, pp. 5-8/

The controversial Colonel-General Gastilovich suggested:

Enemy amphibious landing operations, while en route at sea, do not merit expensive and cumbersome operations against them by the Navy and long-range aviation. The basis of their annihilation can be missile strikes in embarkation and debarkation areas; while enroute at sea, it is again more expedient to annihilate landing forces by strikes with missiles having nuclear charges of several megatons. After discovery of the land forces at sea, these attacks can be calculated on the basis of their passage of a definite point (area).*

Commenting on Colonel-General Gastilovich's proposal, Rear Admiral Lisyutin pointed out circumstances that militate against accomplishing the mission in the manner proposed and also warned against denying territory to the USSR because of atomic radiation. He wrote:

At present the enemy is working toward a system of operational and combat training of embarking landing troops where there are no ports, and he is building ships adapted for this. Consequently, the embarkation of a landing force will most probably take place on a very wide front on an undeveloped coast Moreover, another fundamentally important circumstance is involved. Would it be right to transfer the zone of nuclear combat to our own territory? We believe not. The course of turning one's territory into a desolate

* "The Theory of Military Art Needs Review," by Colonel-General A. Gastilovich, Voyennaya mysl, first issue, 1960, Special Collection, pp. 15-16.

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wilderness can obviously be followed only in certain directions, and then only in the most exceptional cases. 4, pp. 12, 13/

It is known that besides the system of ordinary convoys, the probable enemy is looking for new ways of accomplishing the mission of protecting communication lines. 4, p. 15/

The probable enemy's great dependence on sea and ocean communication lines and the impossibility of securing them reliably during a war give rise not only to the necessity of taking action against his sea and ocean communication lines, but also create favorable conditions for the accomplishment of this mission by the forces of the Navy. 4, p. 16/

Operations for the disruption of sea and ocean communication lines should, under modern conditions, be built, not on the principle of protracted, so-called "systematic operations" with a constant exertion of forces, as was the case heretofore, but on the principle of maximum concentration of forces on decisive axes in a limited time. An interruption in communication lines, even for a month, where the enemy has large-scale personnel and material losses in the main theaters of the war, will create favorable conditions for the successful execution of combat by our armed forces on the major axes. 4, p. 18/

Admiral Platonov, writing in early 1961, seemed to agree generally with Rear Admiral Lisyutin. In discussing combat against convoys, however, Admiral Platonov suggested certain tactics that were not acceptable later to Admiral Kasatonov. Admiral Platonov stated:

Without touching upon the well known questions of the importance and significance to the European countries and to the US of ocean lines of communication, we will

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only point out that this shipping will not cease even after all the naval bases and commercial ports of the warring nations have been destroyed by missile-nuclear weapons strikes. 5, p. 7/

The new capabilities of industry and construction technology now make it possible in the course of one night to install towed and self-propelled pontoon wharves on an unequipped shore, to build artificial harbors, and to carry out roadstead loading of tankers and dry cargo vessels. Consequently, the destruction of ports can cause only a temporary delay of shipping and nothing more. The main burden of the operations for the destruction of shipping, particularly the destruction of convoys, must be transferred to the open ocean If, previously, the main strike against convoys was directed against cargo transports and large surface vessels, such a course of action is now unacceptable. The combat formations of aircraft carrier strike forces have come to be formed in such a manner that it is impossible for either our submarines or aviation to approach the transports without a fight. Not many forces will succeed in circumventing the dense antisubmarine defense screens and the circular lines of protection. Therefore, it becomes necessary to choose the aircraft carriers as the main objective in combat against enemy shipping. 5, p. 8/

Commenting on Admiral Platonov's statement regarding combat against enemy shipping, Admiral Kasatonov wrote:

In examining the task of combating enemy ocean transportation, the author* of the article maintains

* Here Admiral Kasatonov was referring to Admiral Platonov.

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that under modern conditions the need arises to choose, as the main objective for strikes by our forces, not transports, but aircraft carriers. We cannot agree with that statement. In our opinion, it is caused by an obvious overestimation of the capabilities of our probable enemy to cover and defend his convoys. For this purpose the enemy may use aircraft carriers only within the complement of carrier hunter-killer groups or for direct safeguarding to protect only a relatively small number of the most valuable convoys. A considerable number of convoys and transports will follow the ocean lanes without cover by aircraft carriers. (We have already mentioned that carrier strike large units have a very small bearing on the direct protection of convoys.)

Moreover, it is quite difficult to guarantee the selective destruction of aircraft carriers among all the ships and transports of a convoy, even from a purely tactical viewpoint. It is obvious that submarines armed with torpedoes will launch their torpedoes against the nearest large ship or transport during an attack, and strikes by missiles with nuclear warheads from submarines and aircraft must be delivered against the main body of the convoy, i. e., against the transports, calculating on destroying as many of them as possible. Any other solution of the task is scarcely admissible.

Of course, when one has the opportunity to choose between attacking either a transport or an aircraft carrier, preference should be given to the latter. However, in principle, the main objectives for strikes by naval forces in combat with enemy ocean shipping, just as previously, remain the transports with troops and cargo, and the task of disrupting shipping can be accomplished only by destroying a definite proportion of the enemy's transport tonnage. 8, pp. 9, 10/

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Apparently, no special forces to interdict supply and communication lines are being developed or are being considered by the Soviet naval officials other than those already planned to be used against attack carrier groups and Polaris submarines and in conducting naval activities in Eurasian littoral waters, all of which are discussed below.

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IX. Soviet Concepts for Accomplishing Naval Tasks in Sea Areas Contiguous to the Eurasian Land Mass

The part of the mission of the Soviet Navy that is to be carried out in the sea areas contiguous to the Eurasian continents may be broken down into four separate tasks. These tasks are of long standing in the Soviet Navy's role in military strategy. They include the following: (1) defense of the USSR against invasion from the sea, (2) support of ground forces, (3) conducting landing operations on shores of the Eurasian land masses and nearby islands, and, (4) protection of sea supply and communication lines of the USSR.

Little attention is given by naval authors to the threat of the landing of enemy forces on the shores of the USSR, and Admiral Platonov commented only briefly on this subject, as follows:

The predominately continental character of our country has always determined the relatively unimportant place which combined operations of the Navy with other types of armed forces have previously occupied in the wars of the Soviet Union. At the present time, the situation in this respect is changing. We shall dwell briefly on the problems of repelling and of debarking strategic landing forces The debarking of large landing forces for the purpose of opening a new combat front or of transferring combat operations to other continents has been practiced sufficiently often in past wars. As a rule, debarking operations have succeeded, since the initiative in the selection of the time, place, and forces belonged to the attackers. However, the success of the operations of the landing forces on shore depended on the quality of preparedness of the forces, the weapons of the anti-landing defense [protivodesantnaya oborona], and the ability of the defending side to bring reserves to the area of the initial attack and to mobilize internal resources. The

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latter have always existed in a country well prepared for war. Thus, the well known, successfully initiated Dardanelles landing operation of the British and French in 1915 was not exploited on shore, and the brilliantly executed debarking at Normandy in 1944 nearly ended in catastrophe when the Germans broke through the front of the Allies with their tank armies in the Ardennes in December 1944, and that happened when fascist Germany was barely able to stand on its feet, only a few months before its downfall. Considering the above, one must regard the debarking of significant forces by our potential enemies of the territory of the Soviet Union as unlikely at the present time. 5, p. 10/

The remaining tasks are intermingled to a greater or lesser extent according to the military objectives. Because of Soviet orientation toward Western Europe, these tasks are of considerable significance to the naval forces of the Black and Baltic Seas. The greatest discussion of these tasks was by Admiral Kasatonov. He wrote:

The second fundamental mission is support of the ground forces in attack and defense, including support in the operation for seizing the straits zones, with the subsequent exit of submarine forces through the straits for operations in more open areas of the sea theater. To accomplish this mission it is also necessary to combat aircraft carrier and missile vessel large units and prevent the entry of naval forces of the enemy through the straits into the closed sea, or disrupt their combat activity in the straits zone and in the area just outside the straits.

On behalf of a maritime front it may be necessary to accomplish other missions, such as support of the ground forces in forcing the straits and in seizing islands of the straits zone, disruption of the sea transport of the enemy, protecting one's own transport, etc. Furthermore, under current conditions it is possible to examine anew the problem of fire support for the

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maritime flank of the ground forces. Now, of course, there can be no talk of the delivery of fire strikes against the flank of enemy ground forces by tube artillery of surface vessels. At the present time, such a mission is clearly unrealistic. The problem is the employment of the missile forces of the Navy for delivering strikes against enemy ground forces from distances of several hundred kilometers with nuclear warheads. In spite of the fact that the activity of the Navy must be directed, first of all, toward combat with the naval forces of the enemy, on a number of occasions, when it is required by the situation on land and permitted by the situation at sea, it is advisable to bring in missile forces of the Navy, mainly submarines and coastal missile units, to deliver nuclear strikes against objectives on land for the benefit of the troops of a front. However, these operations may not be conducted to the detriment of the accomplishment by the Navy of its basic tasks at sea.

Finally, the fleet must have at its disposal potentialities for accomplishing yet another of its missions. We are talking about tactical naval landing operations. In the course of the execution of operations by the ground forces for the purpose of seizing straits zones and also individual islands and groups of islands, it may be necessary for a fleet to debark small tactical landing forces in coordination with airborne and tank landing forces. A fleet may also be given the mission of supporting troops of a front in forcing the straits, using its means to carry out the ferrying of units of troops and combat materiel.

To fulfill these missions, a fleet will require from the initiation of military operations a certain amount of fast and small amphibious transport means.

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To avoid wasteful expenditures on the composition of these means in peacetime, it is advisable to have them under the authority of civil maritime organizations, rather than in a fleet, and to use them in the national economy for internal sea and river transport. The experience of operating landing craft left over from World War II proved that they are a suitable and economic means for short hauls, particularly when loading and unloading cargo on a seacoast not equipped with wharves. 1, pp. 4, 5, 11/

Admiral Platonov, whose views have been criticized extensively by the other naval authors, argued the necessity for developing forces to occupy the US after its defeat on the European continent. Part of his views against the lack of attention given to the development of landing forces are as follows:

Inasmuch as aggression in a modern war is likely to be from beyond the sea or ocean, it is only possible to reach its nest for the final blow by means of a naval landing operation. It is natural to assume that such a landing must be composed of several armies, that thousands of ships and naval vessels will be needed for its landing, supply, and reinforcement, and that it will be necessary to precede the operation itself by successful operations to achieve air and sea superiority.

But it is certainly necessary to prepare for such an operation, the more so because recently we have completely, and without reason, lost interest in the debarking of landing forces.

In case of defeat, our enemies will evacuate their troops across the ocean, and, as was already pointed

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out above, the landing of our armies on other continents from the sea will be indispensable. It would seem that such a circumstance should have given rise long ago to the intensive construction of landing vessels. However, this did not occur, and in point of fact there are now no landing forces in the Navy.

It should be observed that the fleets prematurely denied themselves the services of the naval infantry, whose training for landing was undeservedly cast aside. The naval infantry were always the bearers of the heritage of naval landing operations, the arm of forces which was well trained in the art of those crucial and dangerous first assaults upon the shore. Even now, naval infantry has not yet lost its importance. 5, pp. 11, 16, 17/

The suggestion that preparations be made to cross the oceans with landing forces has not been supported or even argued by other naval writers. It is implicit that such an operation is not now nor is it even planned at this time as a part of Soviet Grand Strategy.

Rear Admiral Bogolepov, writing in December 1961, commented on amphibious operations, as follows:

If we refer to long-range transport, namely transoceanic, then, of course, military science must always be ready to report at the first demand of the leadership, comprehensive, clear views on the most advantageous variants of forces, weapons and methods for carrying out such transport, with detailed calculations of the time periods necessary, and the cost of creating these forces and weapons. Logically, the following thoughts should be presented here.

Long-range (transsea and transoceanic) transport may be carried out on the water, in the air and by special methods.

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Large-scale underwater transport has poor future prospects, as a result of its high cost and vulnerability.

Surface transport is entirely feasible but requires the support of forces that are superior to those of the enemy. What kind of forces? At present, with the inadequate range of aircraft -- mainly surface means. Calculations show that if we wanted to we could create such forces no earlier than 15 to 20 years from now, and this is clearly useless. In the first place, in ten years the international situation will have changed sharply. "When the Soviet Union becomes the first industrial power" -- said N. S. Khrushchev at the XXII Congress -- "when the socialist system is finally transformed into the decisive factor of world development, when the forces of peace multiply even more throughout the entire world, then the balance will finally be tilted in favor of the forces of peace and the barometer of the international weather will show: clear. The threat of a world war will have passed forever."

Secondly, the technical situation also changes: it will suffice for autonomous aircraft to appear, to have the significance of aircraft carriers fall off sharply.

Hence the only realistic possibility for our carrying out such transport consists of creating sufficiently autonomous, powerful aircraft -- not only for the direct performance of part of the transport by air, but also for screening the other part of it -- the transport carried out by sea. 11, pp. 11, 12/

It is always of interest to examine the manner in which statements of political leaders are brought into discussions of military affairs. In the above quotation, Bogolepov recognizes that international situations are subject to change and may affect military plans for the future.

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His quotation from Khrushchev tacitly implies concurrence. However, a few paragraphs later in Bogolepov's article, wherein he is commenting on other tasks of the Navy, he stated: "An important question is the creation of an amphibious fleet, which, unfortunately, we hardly concern ourselves with," 11, p. 13/ indicating that he probably considers the landing of forces necessary to the successful conclusion of a war.

To a large extent, the same forces would be used in many of the tasks covered below. A discussion of the employment of weapons, not heretofore discussed in connection with other tasks, may be useful.

A. Coastal Missile Units

Admiral Kasatonov, writing early in 1960, visualized coastal missile units as having an important role in combat against enemy forces in closed sea theaters. He stated:

In the immediate future coastal missile units must become the main strike force of the fleets in combating enemy naval vessels within the limits of the closed sea (and partially even in the straits zone). These units, armed with cruise missiles with a range of more than 500 kilometers, with inertial guidance [avtonomnoye upravleniye] for firing against areas, and with a homing device [ustroystvo samonavedeniya] for destruction of vessels at sea, will be able to cover with their fire the entire waters [akvatoriya] of a closed sea and make enemy combat activity and the operation of enemy naval vessels and transports within its limits practically out of the question. The limited dimensions of closed seas make it possible to use to the fullest extent modern radio navigation and hydroacoustic navigation systems of high accuracy to provide orientational support to reconnaissance vessels and planes, which in turn makes it possible to provide accurate target designation for coastal missile units. Target

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designation can also be effectively provided by long-range coastal radar stations. 1, pp. 8, 9/

Rear Admiral Bogolepov, in October 1960, commenting on "land-based cruise missiles," stated:

And, if one speaks of offshore [pribrezhnaya vodnaya] zones saturated with technical shore surveillance means, then such a solution to the problem at least in relation to surface objectives, as a practical matter, is not only feasible, but in many cases even more advantageous.

The width of the coastal zone now consists of several hundred kilometers and, in accordance with the development of technology, is growing continually. Extensive investigation must define precisely the order of this growth in the near future, but in any case one must consider that in some offshore naval theaters land-based missiles already are becoming the backbone of naval forces.

It may be asked: Why are land-based missiles regarded as a naval force, even if only provisionally? For the same reasons that "one gun on shore is worth ten guns on a vessel," as has been correctly assumed up to now, considering that one of the basic elements of naval forces is the so-called shore defense, including, above all, artillery. A naval direction is not necessarily connected only with vessels; it is connected with those forces and weapons by means of which it is more advantageous to accomplish the existing missions. 2, pp. 4, 5/

Here also Admiral Bogolepov regards coastal missiles units as necessarily being part of naval forces.

Rear Admiral Zvagin, writing early in 1961 on the use of surface vessels in modern naval warfare, referred to the "missile

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troops of the Navy." It is believed that he was referring to coastal cruise missile units. He wrote:

The operations of missile vessels covering the troops on shore who are on the defensive against the enemy strikes from the sea are carried out in coordination with units of missile troops of the Navy. 6, p. 16/

Admiral Kharlamov, in criticizing Admiral Platonov for unjustified complaints about the conduct of a naval exercise in the Pacific, seemed to imply the use of shore based cruise missile units against inland targets, as follows:

As is generally known, during the Pacific Fleet exercise the concept and plan of naval operations envisaged action against objectives located on the mainland and on enemy island bases, as well as strikes against carrier strike forces on the ocean. For this purpose it was planned to use aviation, shore missile units and a unit of submarines. However, for obvious reasons, strikes against the bases and against objectives of the probable enemy located on shore could not be worked out in practice. 10, p. 11/

Although this statement is obscure as to which systems would be used against specific targets, one possible interpretation is that coastal missiles may have been contemplated for strikes against land targets. In the northern part of the Sea of Japan, a missile with a range of 500 kilometers is sufficient for this purpose.

The rather high stature assigned to coastal missile units by these authors and the implication that by sometime in 1960 coastal missiles were available with ranges of as much as 270 nm is very significant. Other intelligence has indicated only a short-range system (30 to 40 nm) employing a modified version of the Kennel ASM. If Soviet coastal units are to be equipped with 270 nm missiles, then probably a modified version of the submarine-launched SS-N-3 missile or the Shaddock cruise missile exhibited in the Moscow parades in 1961, 1962 and 1963 will be employed.

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B. Surface Ships

Rear Admiral Zvyagin, writing early in 1961, began his article with the premise that the submarine was becoming the basic striking force of the Soviet Navy and that the role of surface ships has changed from a naval striking force composed of battleships, cruisers, and destroyer to a defensive force composed of missile-carrying and helicopter-carrying ships for use in ASW, in the support of basing and deploying naval forces, in defense of naval communication and of the coastline from attack by enemy surface ships, and in resolving other tasks, as follows:

The important qualitative changes taking place in the armed forces as a result of their being equipped with the newest combat weapons have changed the role and place in war not only of the types of armed forces, but also of the arms of forces and troops. In our Navy these changes are apparent primarily in that the submarine is becoming the basic striking force of the Navy.*

It is a fact that such large ships as battleships, cruisers, and destroyers, to give them their former designation, have completely lost all combat value and have no prospects of being used as a naval striking force. The role of the latter has been given to the submarines.

But, as it is well known, the purpose of surface vessels was not exclusively to resolve combat missions through the use of large vessels. An important

* Rear Admiral Zvyagin footnoted this point by saying, "The navies of the large capitalist countries have as their basic striking force large units of aircraft carriers, consisting of surface vessels and deck-based aircraft. In the near future the role of the main striking force will be assigned to the missile-carrying nuclear submarines, which are being built at an accelerated pace. The navies of the secondary naval powers are putting greater emphasis on the development of anti-submarine defense, which consists of surface vessels and anti-submarine aircraft and helicopters."

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role was played by vessels of other types in support of the basing and deployment of naval forces, including submarines, in defense of naval communications and of the coastline from attack by enemy surface vessels, and also in resolving other missions.

The missions of surface vessels under modern conditions have essentially changed. As already stated, in the near future the basic striking force of our probable enemy's Navy will be missile-carrying nuclear submarines Fighting against these enemy forces will be conducted by special submarines of the antisubmarine defense, aviation, and surface vessels.

For the present, as well as in the near future, the most effective solution of the mission of combat against enemy nuclear submarines can be achieved only by the complex utilization of all available forces and means. Tracking facilities at present included in the equipment of surface vessels allow search and pursuit of enemy submarines to be conducted with great effectiveness. When surface ships are equipped with antiaircraft missiles and helicopters, their potential in combatting submarines will become even greater. Such an appraisal of the role of surface vessels in combatting enemy submarines is dependent on their ability to remain at sea for long periods of time at a considerable distance from land and to reconnoiter large areas of the sea in short periods of time with the help of helicopters.

The dispersed basing of the naval forces, the use of dispersed antiatomic combat and transit formations, the constant threat from enemy aircraft, submarines, and mines all stipulate the need to give cover to submarines not only when entering or leaving their bases, but also to cover their

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deployment for operations in the open sea. Such support will take the form of combat with the anti-submarine submarines of the enemy which are deployed at the points of emergence of our submarines -- in the narrows as well as along their probable routes to the open sea -- and the detection and destruction of mines along the route of passage. Although the antisubmarine submarines and aircraft will be able to conduct combat with enemy submarines, surface vessels will play an important role in this engagement under cover of anti-aircraft missile units of the Navy and the Anti-aircraft Defense of the Country. As far as the danger from mines is concerned, it will be effectively conducted both now and in the near future only by surface vessels It will be necessary to bring in our missile-equipped surface vessels to engage with those enemy surface vessels which are interfering with the deployment of our submarines; for use as protection for vessels of antisubmarine defense, which are engaged in searching for enemy submarines at a considerable distance from shore; and for dealing with the destruction of enemy landing craft and their support ships.

In a future war a significant role in support of ground troop operations will be the providing of sea transport of men and material, mounting tactical landing operations and disrupting naval communications between the enemy's coastal groupings and his rear bases. For the solution of these missions it will be necessary to use, along with other forces, surface vessels of small displacement. Only surface vessels of various designation will be able to accomplish such missions as protecting the transport of troops and military equipment, heavy freight, and troop landings.

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It will be up to surface vessels equipped with anti-aircraft missiles to screen convoys and transports from aerial attack during their passage and in many cases the vessels at their bases.

Surface vessels will have a definite role in the laying of anti-submarine and anti-landing minefields.

Such are the basic missions which require the use of surface vessels. It is obvious that complete solution of these missions cannot be accomplished by conventionally armed ships. New classes of vessels with modern weapons will be required.

The composition of the Navy must include special vessels of two basic classes for anti-submarine warfare against enemy submarines; vessels for short-range operations, and vessels for long-range operation. Both classes must have modern hydro-acoustical equipment, powerful anti-submarine weapons, anti-aircraft missile weapons, and anti-submarine helicopters. With such aids they will be able to carry out long-range searches and destroy enemy submarines.

Special vessels such as trawlers, landing craft, and transports will be needed for locating and destroying mines, and transport of landing parties, troops, and equipment.

Vessels equipped with missiles will cover anti-submarine defense vessels against attack by enemy surface vessels, primarily from carrier-borne hunter-killer groups of anti-submarine defense forces, and will escort convoys and landing parties during their ocean passage.

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Antiaircraft defense vessels will be needed to screen antisubmarine defense vessels, convoys, and landing parties during the sea passage and in many cases to protect the bases of submarines and other combat vessels against air attack. 6, pp. 2, 3, 4, 5/

There seems to be little debate about the doctrine governing the use of these forces, but there seems to be considerable striving for the improvement of the capability for these forces particularly in the area of ASW and missile armament.

Admiral Kasatonov writing on the use of naval forces in a closed sea theater stated the role of surface ships, particularly those armed with missiles, much as did Rear Admiral Zvyagin, as follows:

Finally, surface missile vessels (particularly missile boats) must occupy a definite place in the composition of the strike forces of the Navy in closed sea theaters. In our view, the main mission of surface missile vessels will be combating surface vessels of the antisubmarine defense, carrying out combat operations against the sea communications lines of the enemy in order to protect our own sea supply, and also combating enemy vessel forces in the island areas while supporting the ground forces in seizing the straits zone and in support of the exiting of submarines through the straits. 1, p. 10/

In open theaters of operations missile vessels will have to be detailed for screening convoys against possible strikes by enemy surface vessels. 6, p. 15/

Missile vessels, especially patrol boats [kater], will be used extensively to cover the landing force during their transport at sea, from enemy missile vessels. In many cases these vessels can be merged into detachments of fire support vessels [otryad]

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korabley ogneyov podderzhki] assigned specific targets on shore, in the interests of the support of the landing operations.

Missile vessels and patrol boats will play an important role in the resolution of missions for the destruction of coastal communication lines serving the enemy's maritime groupings of troops. In addition, missile vessels can be used for the destruction of enemy surface vessels supporting ground troops which are situated outside the range of fire of the coastal, short-range missile complexes. 6, p. 16/

Both Admiral Kasatonov and Rear Admiral Zvyagin acknowledged a weakness of present missile ships in their lack of anti-aircraft protection, as follows:

The combat durability of surface missile vessels can be increased primarily by providing them with reliable anti-aircraft defense, especially by arming these vessels with anti-aircraft missiles and including special anti-aircraft defense vessels in the battle order of missile formation. 1, p. 10/

Equipping vessels with anti-aircraft missiles will lessen their dependence on constant air cover provided by land-based fighter aircraft, will permit them to resolve missions outside coastal zones of the anti-aircraft defense and to defend themselves from the means of enemy air attack. However, the restricted supply of anti-aircraft missiles always will be the reason for the ship's limited time at sea. 6, p. 8/

Rear Admiral Bogolepov, commenting on the protection of shore communication lines from enemy submarines and aircraft, stated:

Of course, anti-aircraft defense vessels carrying a number of anti-aircraft missiles,

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as well as helicopter vessels of the antisubmarine defense, could also be useful for these purposes. However, the role of the antisubmarine defense vessels will be too passive: owing to the short range of operation of their weapons, they cannot combat the enemy's aviation itself, but only the missiles launched by it. 2, p. 9/

Rear Admiral Zvyagin also commented on the difficulty of combatting enemy aircraft, as follows:

The conditions of the use of surface vessels of various types at the present time are characterized first of all by the fact that it became more difficult for them to defend themselves against enemy air attacks than previously. Aircraft carrying missiles can use their weapons against surface vessels from distances of much greater range than anti-aircraft missiles launched from vessels. For this reason surface vessels have practically lost the capacity to defend themselves against air attack and are faced with the necessity of counter-acting airborne missiles of great speeds, equipped with homing guidance and powerful nuclear charges, and having a high probability of hits. 6, p. 5/

Both Rear Admiral Zvyagin and Admiral Platonov considered the advisability of multipurpose ships, and Zvyagin even considered the use of nuclear power in surface ships, as follows:

Equipping surface vessels with cruise and anti-aircraft missiles, with modern means of antisubmarine defense and installing new engines -- steam-turbine and nuclear -- will permit a wider use of surface vessels. New surface vessels will be able to stay away from their bases for a long period of time and, operating at a significantly long range from their coast, they will be able to perform various important combat missions. 6, p. 17/

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Experience shows that in the construction of forces it is detrimental to be carried away by vessels of narrowly assigned purpose, such as, for example, submarine chasers or anti-aircraft defense vessels. The combining of a number of missions in one vessel noticeably reduces expenditures for construction. Therefore, it is necessary to strive for good designs [proekt] of a universal submarine capable of accomplishing both attack missions and anti-submarine defense missions, a corvette with equally powerful anti-aircraft and anti-submarine defense weapons. 5, p. 16/

In sum, these naval authors indicate that existing Soviet missile-armed surface ships are largely defensive weapons. Other intelligence shows that the Soviet surface fleet has developed since 1957 very much along the lines discussed in the Special Collection. The first missile-armed destroyer, the Kildin class, appeared in 1958 followed quickly by the larger Krupnyy class in 1959. Guided missile patrol boats of the Osa and Komar classes also began to appear in 1959. To date about 12 destroyers armed with the surface-to-surface cruise missiles (SS-N-1) with a range of 30 to 40 nm that use the destroyer's own detection apparatus* have appeared along with about 130 patrol boats armed with the 15-nm surface-to-surface missile (SS-N-2). The first surface ship armed with a SAM system appeared on a Black Sea cruiser followed in 1962 by the appearance of a Kotlin-class destroyer modified to carry one SAM launcher. The first Soviet surface ship armed with combined SSM and SAM systems is the formidable Kynda-class guided-missile destroyer leader of which four have been detected under construction and two are operational as of mid-1963.

The likelihood of equipping surface naval ships with nuclear power is considered to be remote.

* It has been estimated that this missile system has a range up to 130 nm when the launching ship has a forward observer in an aircraft.

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C. Naval Mines

Very little is said by the naval authors about the use of naval mines. Rear Admiral Zvyagin has more to say than any other author, chiefly because of the use of mines in naval operations in coastal zones. He stated:

Surface vessels will have a definite role in the laying of antisubmarine and antilanding minefields. 6, p. 4/

The potentialities of the mine as a weapon against surface vessels have also substantially increased. The present day reaction-surfacing [reaktivno-vsplyvayushchiy] mines are equipped with extremely sensitive non-contact detonators; these are based on the principle of exploitation of various physical fields of the vessel, and are adapted for installation within a wide range of depths. These properties make for a considerable increase of the areas considered hazardous for surface vessels. Conducting combat with mines in a theater of operations will take much effort and various combat means will have to be used. This will also limit the possibilities of the use of surface vessels for the solution of combat missions. 6, p. 6/*

During support of submarine deployment, simultaneously with the solution of missions of combat against enemy antisubmarine forces, there will have to be a search for and destruction of mines laid along the line of passage of the submarines. Trawlers and helicopters can be used for this purpose. Special groups must be formed from these, capable of destroying mines in those areas which cannot be bypassed by the submarines. 6, p. 11/

* The "reaction-surfacing" mine mentioned is possibly[#]a self-propelled, acoustic mine.

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The use of surface vessels in antimine defense will consist of the detection and destruction of mines in the areas of bases and of operations of submarines and surface vessels, as well as along the routes of convoys. Inshore the search for mines will be carried out by search vessels [korabliskatel], jointly with the coastal and sea-going resources of PMO. In areas far removed from the coast, this mission can be resolved only by means of vessels.

In their search for mines in coastal areas where the places of mine-laying are determined by shore-based or floating posts of anti-mine detection, the search vessels must move into the places indicated by these posts, and conduct a search for the mines. The destruction of the mines located will be done by special vessels guided by the search vessels. 6, p. 15/

Both Admiral Panteleyev and Admiral Kharlamov, however, refer to mining operations in areas far from Soviet shores. Admiral Panteleyev stated:

It is now essential to create separate submarine large units capable of independently resolving tactical and operational missions. We have in mind submarine squadrons of vessels with atomic propulsion. Such a squadron must consist of ... mine laying submarines 7, p. 8/

Admiral Kharlamov probably defines the task to which Admiral Panteleyev alluded, as follows:

It is felt that combat with missile submarines is to be carried out with equal intensity in both close and remote areas. It will consist of strikes against missile submarine bases, the mining of their basing points, and destroying them in remote areas, prior to their approach to firing positions. 10, p. 19/

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Rear Admiral Zhukovskiy mentioned the use of mines against Polaris submarines operating in Norwegian fiords, as follows:

To hinder or eliminate the operations of missile submarines in fiord areas, there can be carried out systematically the concentrated laying of antisubmarine mines 9, p. 22/

D. Naval Auxiliary Ships

Part of the development of Soviet naval forces in recent years has been the building of specialized types of auxiliary ships. Before 1955, naval auxiliaries were created by converting existing merchant ships; since then a number of newly built specially designed auxiliaries have appeared -- for example, the Don-class submarine tenders, the Lama-class guided-missile-support ship, and the nuclear submarine support ship Project No. 326.*

With the seaward extension of naval operations, particularly submarines, both in combatting NATO's naval forces and in the movement of naval forces along the coastlines of the Eurasian continents in support of army activities, in wartime, the development of naval auxiliaries has become an important operational requirement. Although the planning for these operations apparently has not been worked out fully, it is of interest to examine what the naval authors say about it.

Rear Admiral Lisytin pointed out the necessity for continual deployment of forces at sea and the dispersion of bases along the coast line, as follows:

In conditions of a sudden outbreak of a missile/nuclear war, the Navy has greater combat stability than the other types of armed forces, owing to the possibility of being at dispersed bases on a long stretch of coastline, and also of being able to put

* See Appendix C.

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to sea in advance. Dispersed naval forces will not present an attractive target to an enemy for strikes by the enemy's multi-megaton nuclear charges [zaryad], the use of which is most likely at the beginning of a war, at the time when the large units of other types of armed forces, though dispersed over large areas, can be subjected to great destruction as a result of such strikes. 4, pp. 3, 4/

Insofar as the operations of our forces, especially of submarines far away from their bases, involve their return to base after using up their units of fire, which leads to a great reduction in their coefficient of combat utilization, the main problem for ensuring that the forces can operate effectively is in supplying them with missile/nuclear weapons and torpedoes and in resupplying them at sea with material-technical resources.

The first reloading of submarines at sea in the initial period of a war could be carried out to some extent by using modified transports and merchant ships sent in advance to designated areas of the ocean which are poorly watched.

We should also follow the course of creating secret depots, especially under water, in specially selected areas situated close to the areas of combat operations of our submarines.

The question of creating new, or reconstructing existing, diesel-battery submarines for service as supply bases also merits attention.

The creation of special floating supply bases, especially for missile/nuclear weapons and torpedoes, which have maneuverability and are less vulnerable than depots located on land, is absolutely essential

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for supplying our forces away from permanent naval bases which could be subjected to destruction at the very beginning of a war. 4, pp. 18, 19/

Admiral Kasatonov, writing on the operation of atomic submarines armed with cruise missiles beyond the limits of a closed sea theater, stated:

The extension of special measures for the ... subsequent replenishment of expended missiles will be required. 1, pp. 6, 7/

Admiral Panteleyev, who devoted most of his article to submarine operations, wrote:

A system [must be worked out] for all types of underwater supply, for submarines lying on the bottom at points of dispersal and at definite depths and not moving.

A class of special submarine tankers and submarine transports for the shipment of combat supplies, equipment, and contingents of personnel [must be created]. 7, pp. 21, 22/

The considerable emphasis on secret and underwater supply bases for submarines bears watching in the future because of its potential to make a sudden (if temporary) extension to the range of the very large Soviet fleet of diesel submarines. Some of the intelligence [redacted]

[redacted] may be indicative of this type of activity.

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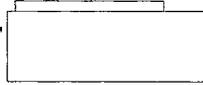
X. Use of Chemical or Biological Weapons

It is significant that in none of the articles in the Special Collection is there any discussion of the use of chemical or biological weapons by the Navy. It is believed that this omission indicates that these weapons are not contemplated for use in the primary task of the Soviet Navy as indicated in the Special Collection -- that is, defense against carrier task forces and Polaris submarines.

Earlier reports that chemical artillery shells were available at Soviet naval bases for 85-mm and 105-mm guns strongly indicate that the Soviet Navy has had specific plans for the use of such weapons. This earlier consideration of the use of such weapons militates against a confident conclusion that the omission of any discussion of chemical or biological weapons in the Special Collection signifies a complete rejection of this type of weapon or the absence of such weapons for use in other naval roles.

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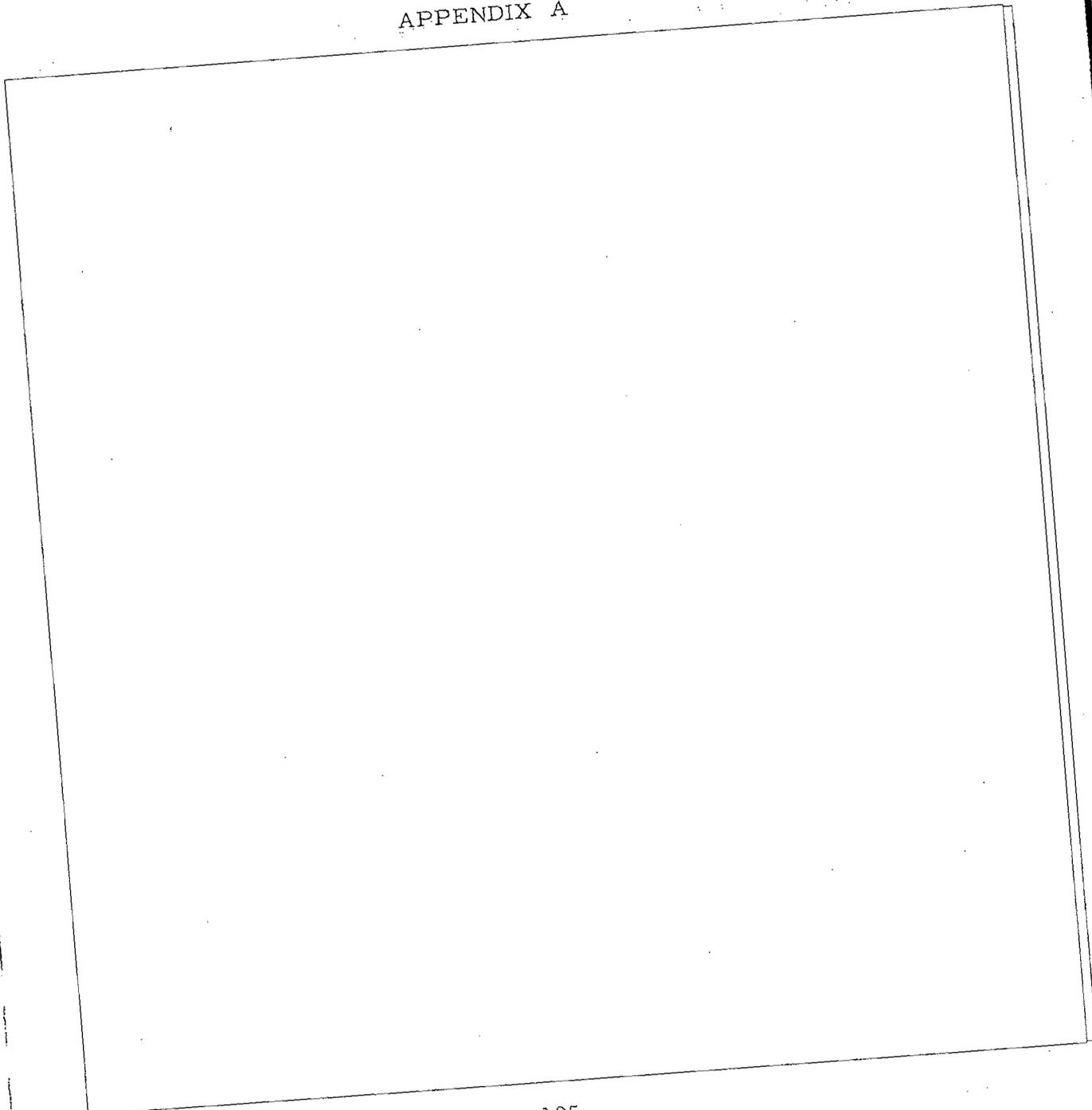
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APPENDIX A



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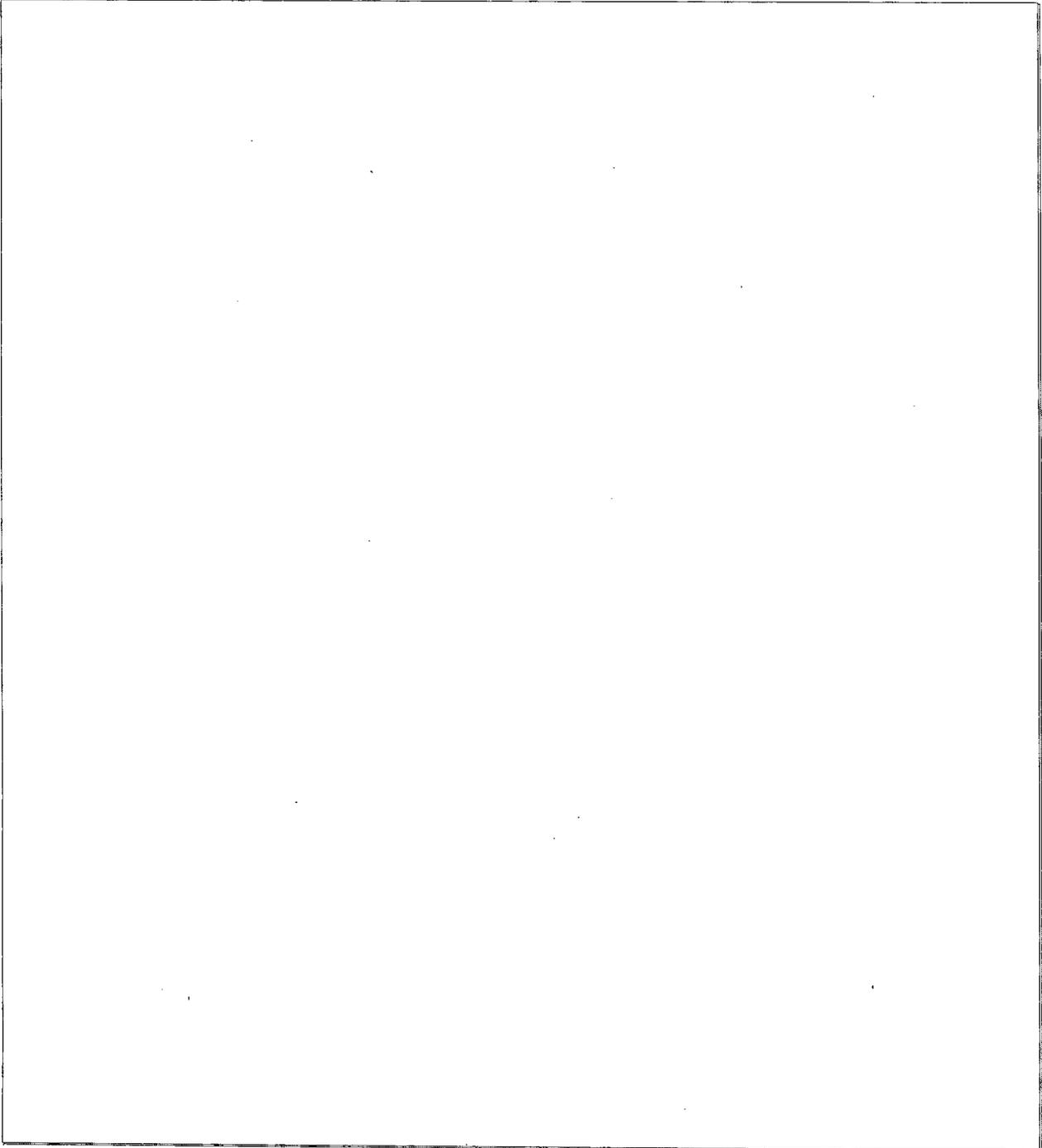


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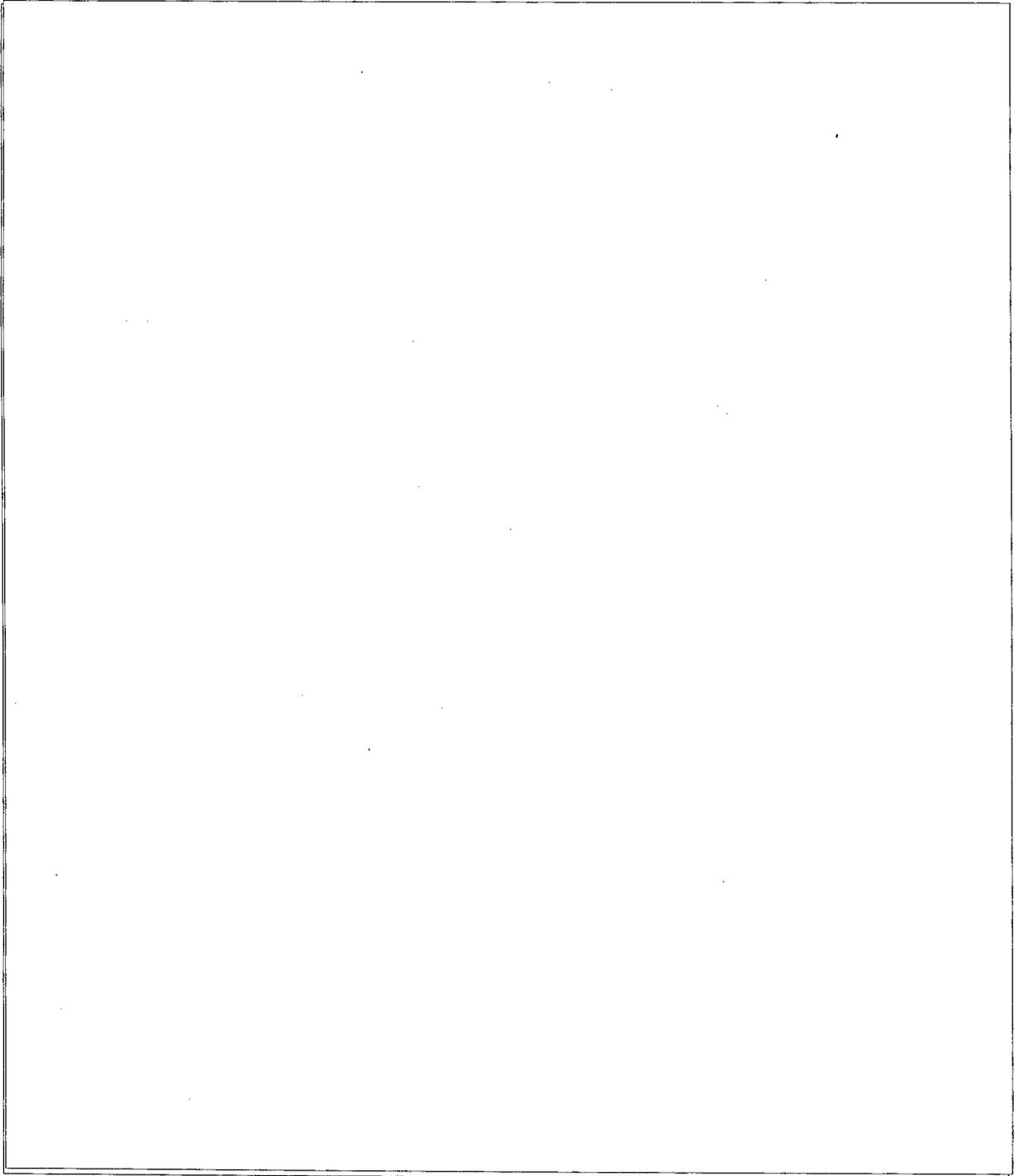


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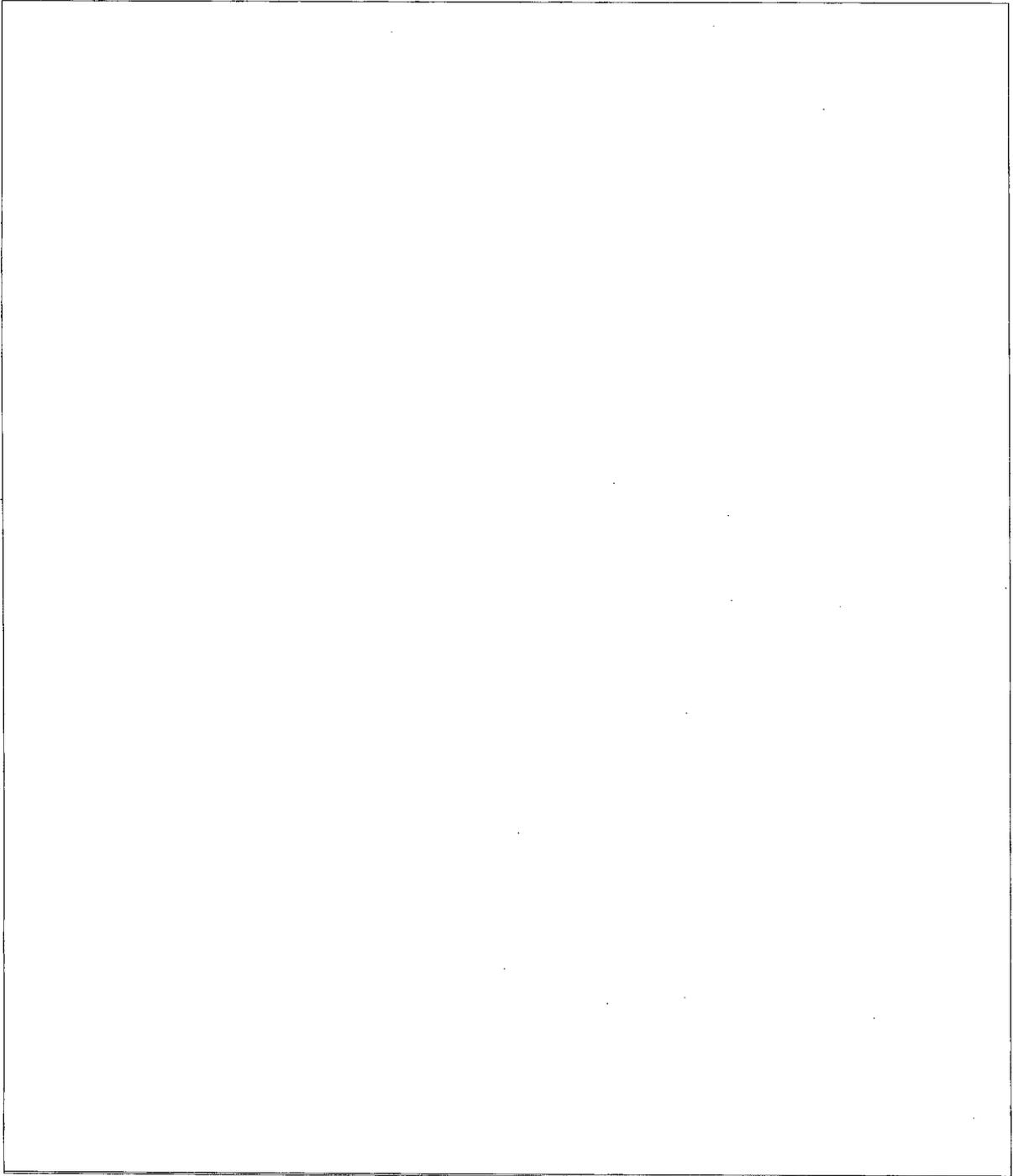
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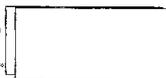


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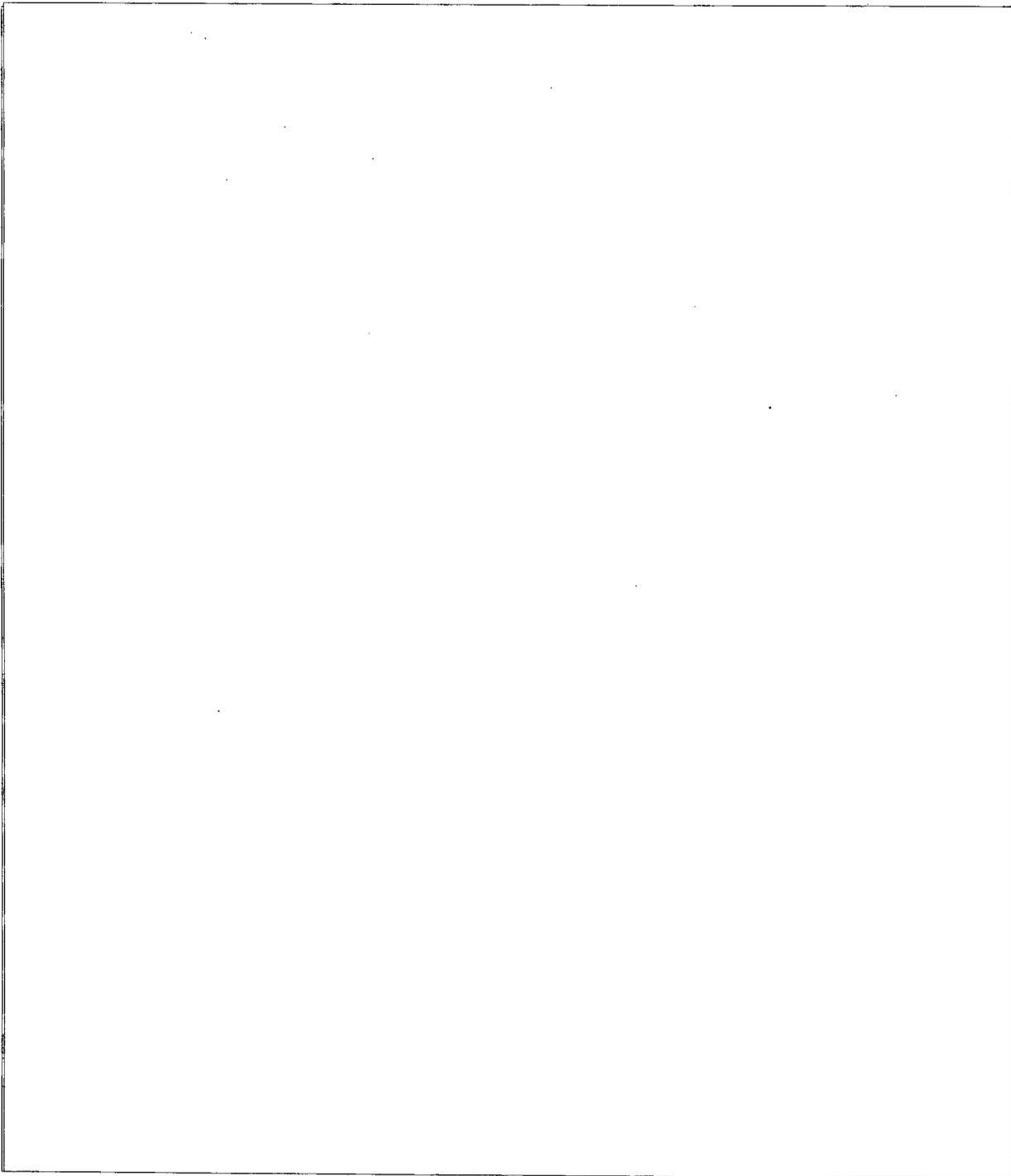
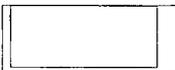


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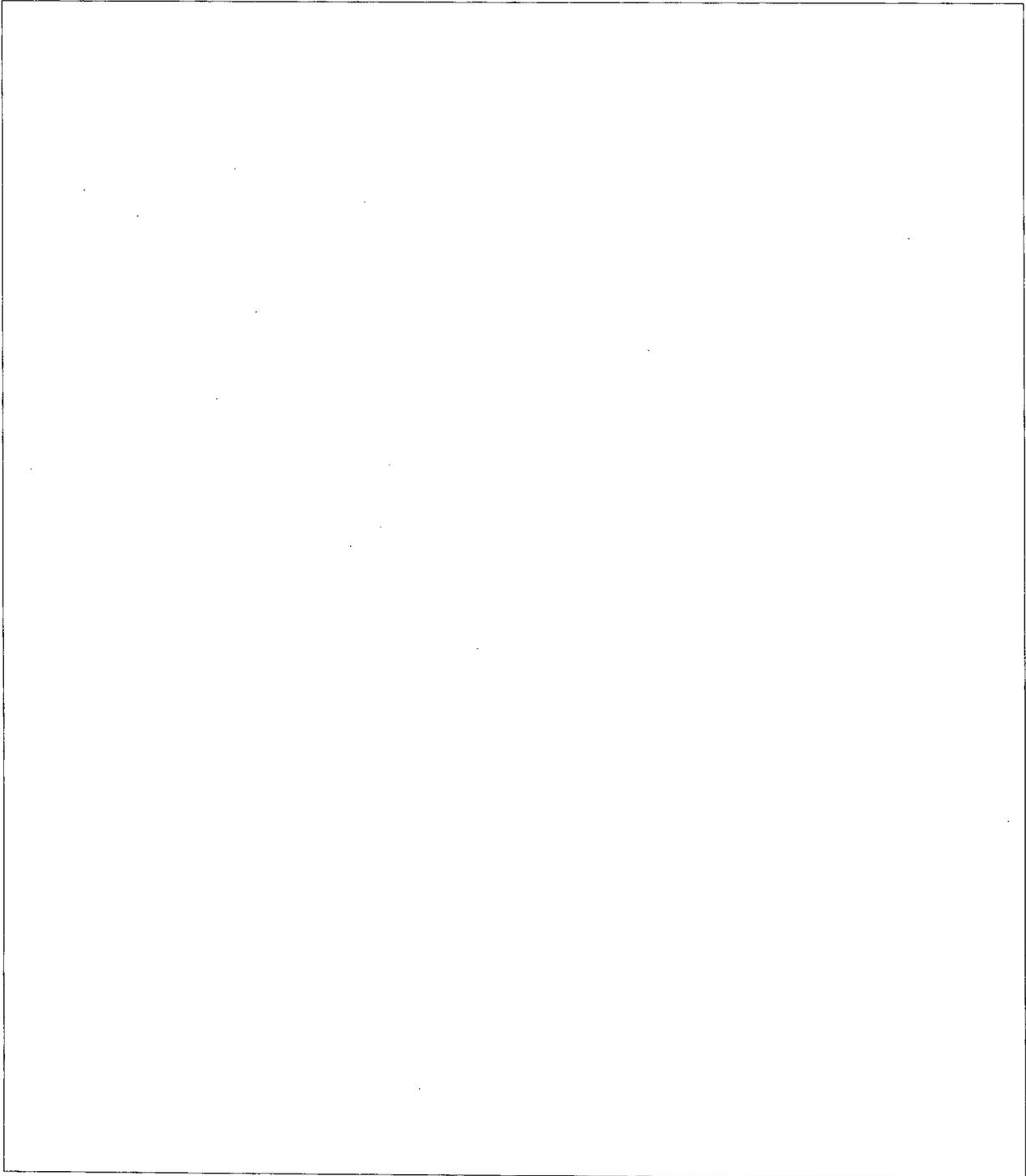


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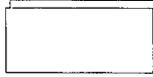


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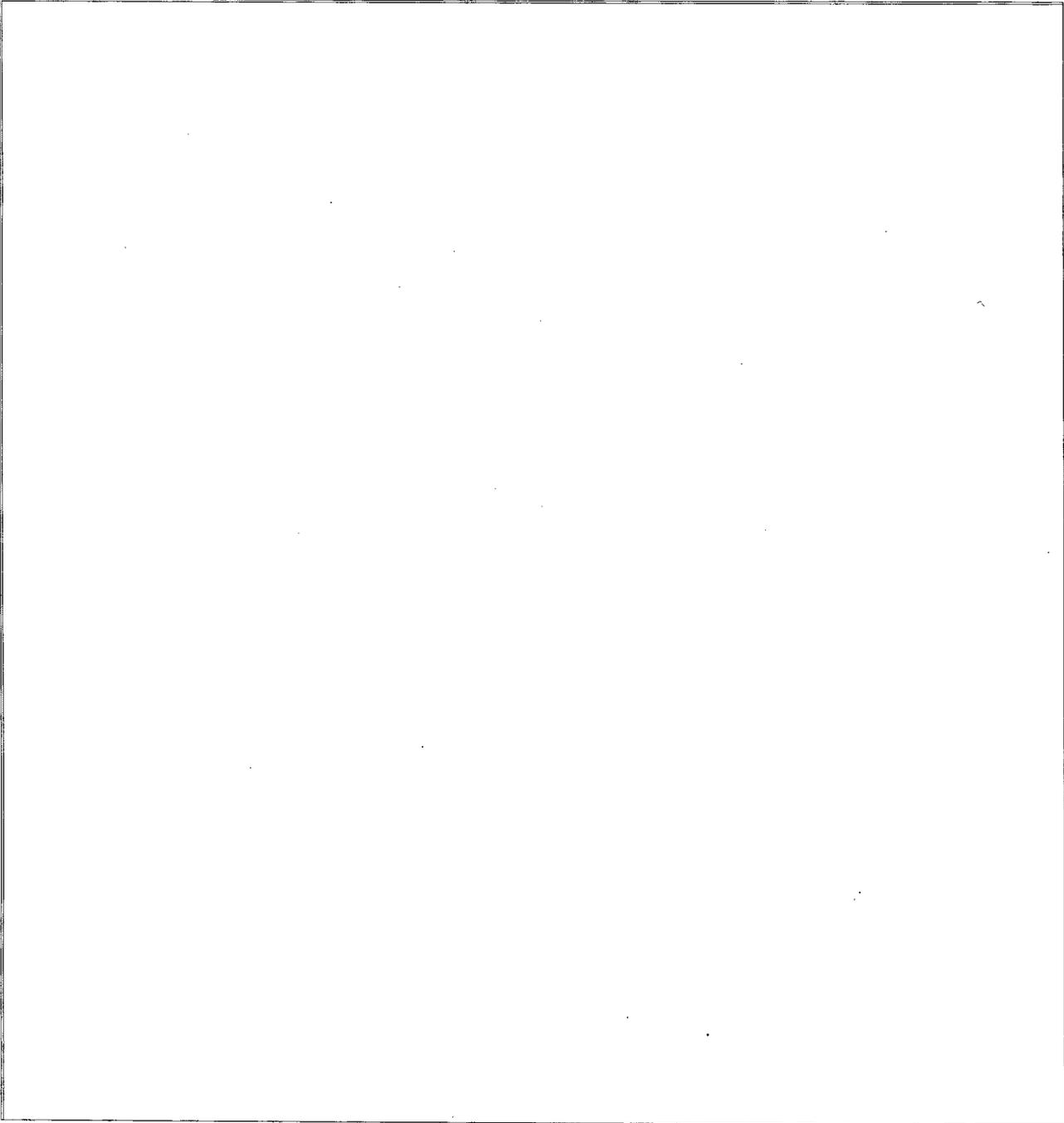


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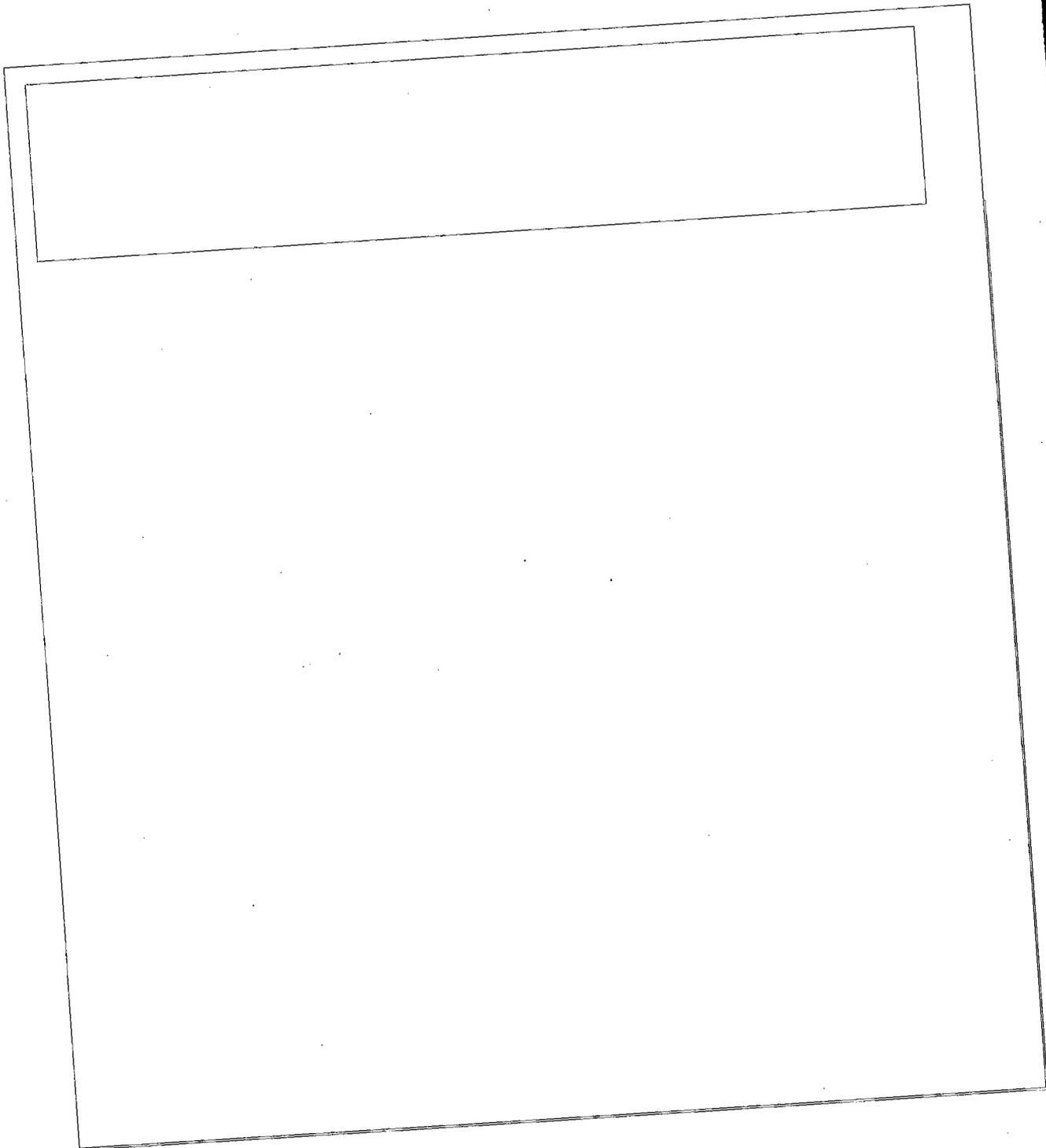


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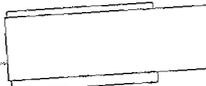
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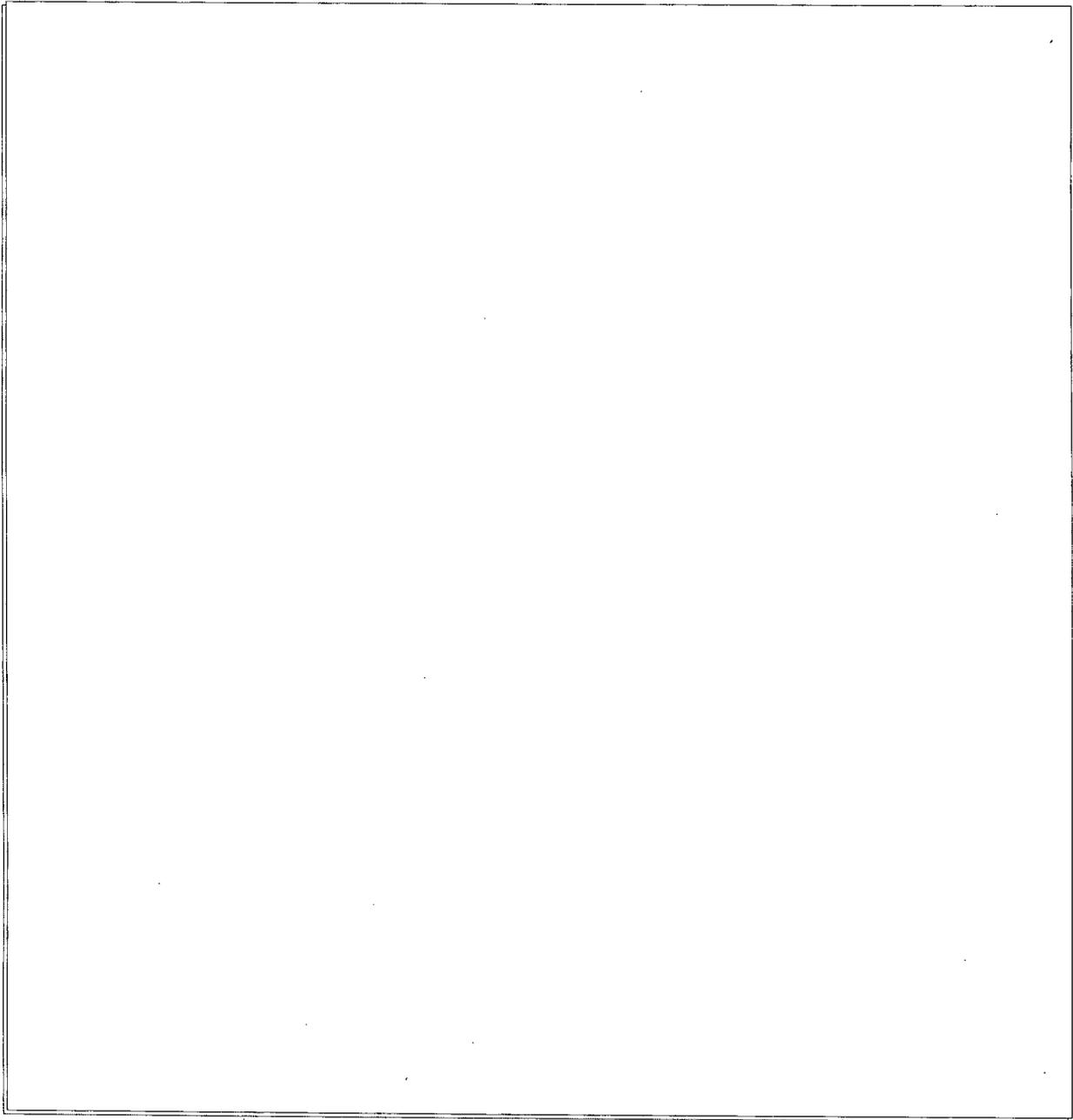
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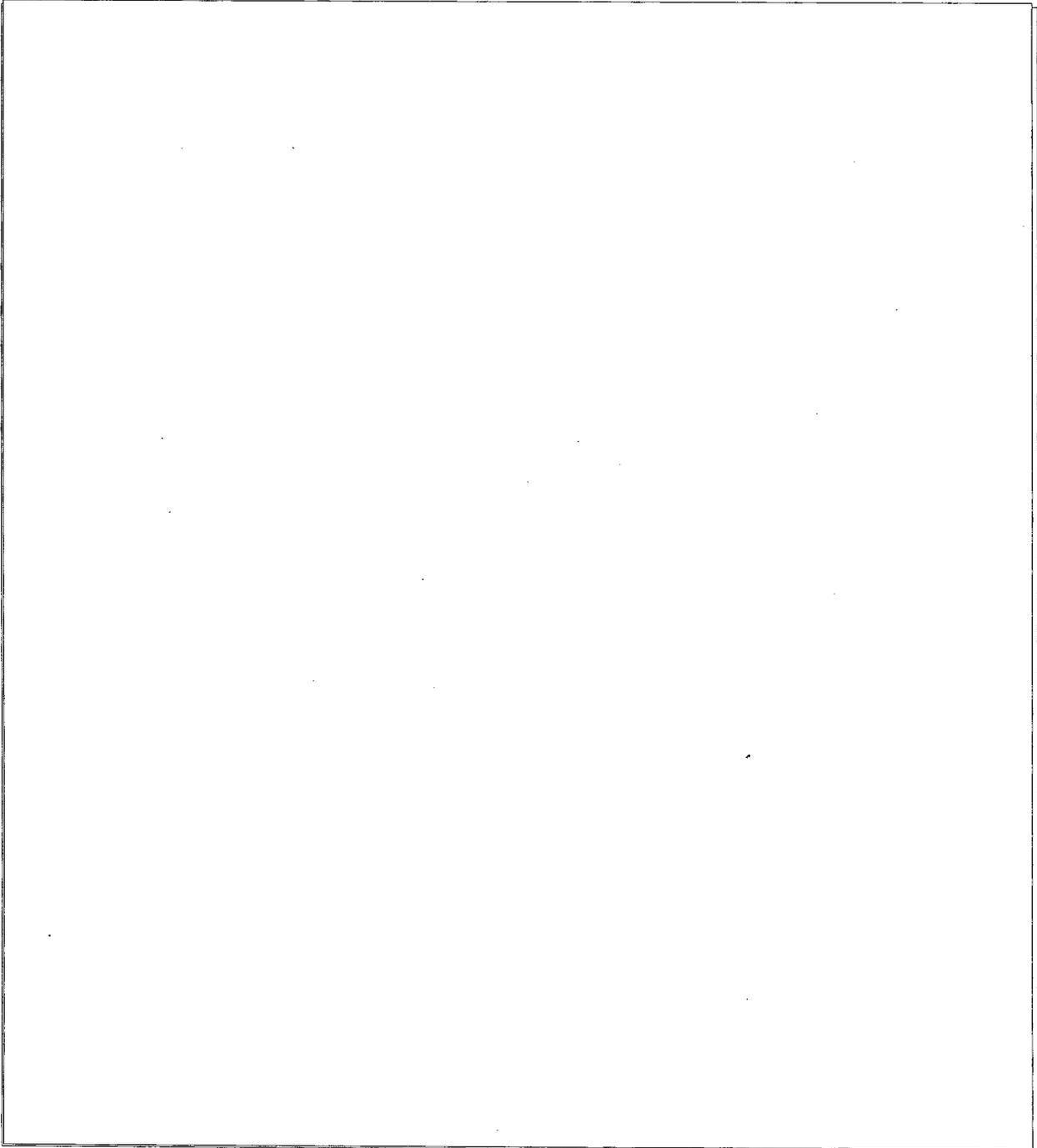
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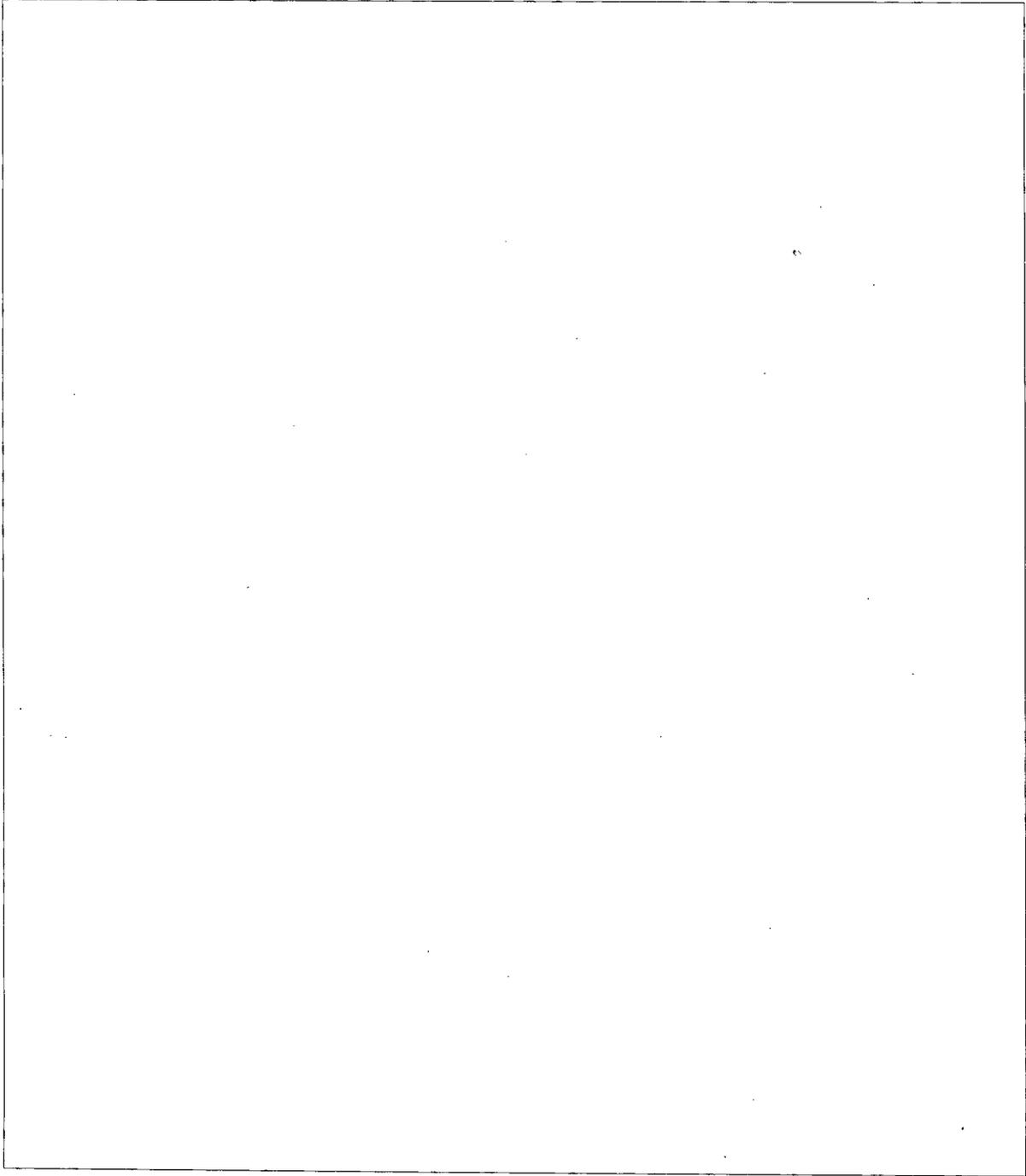
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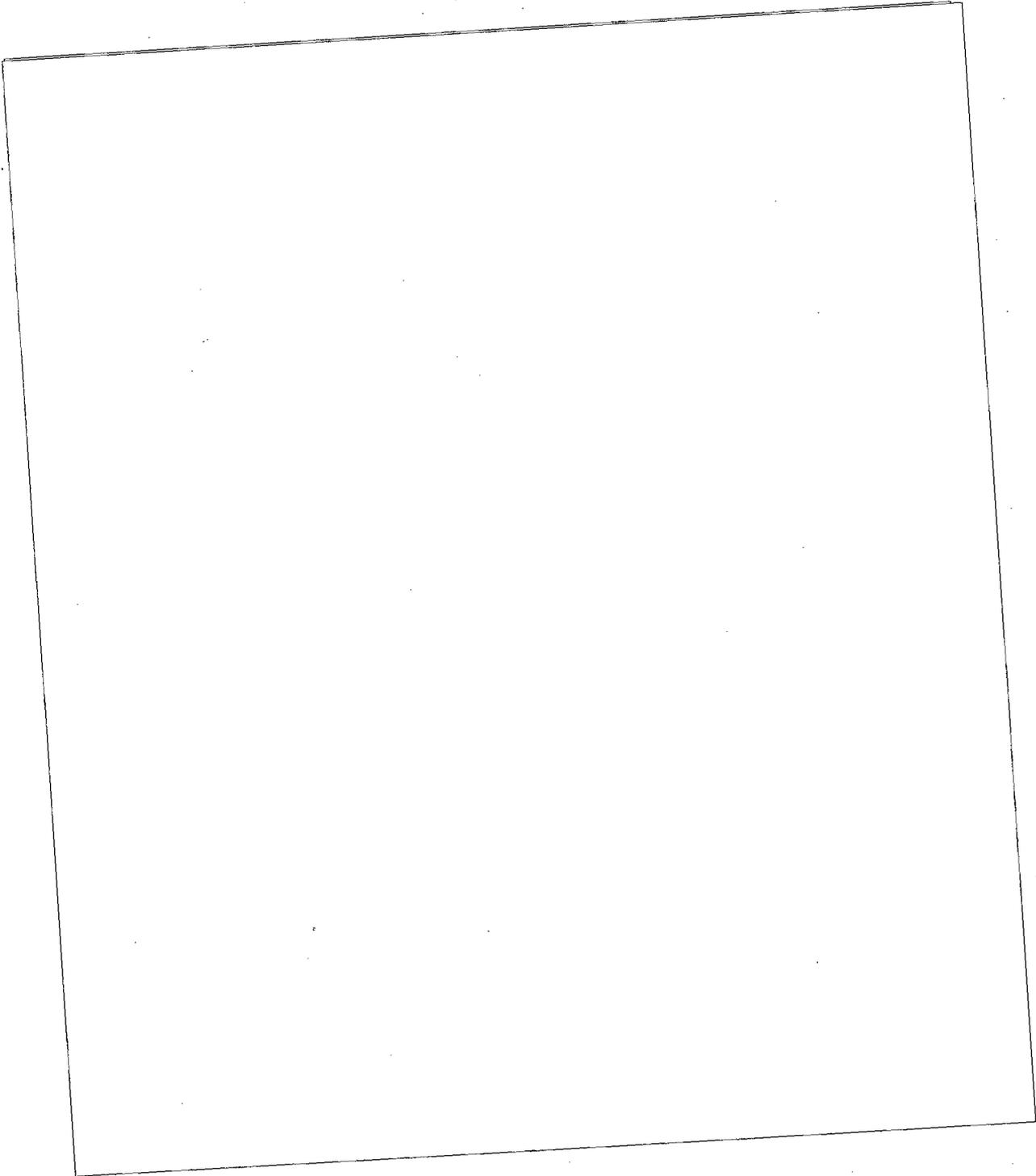
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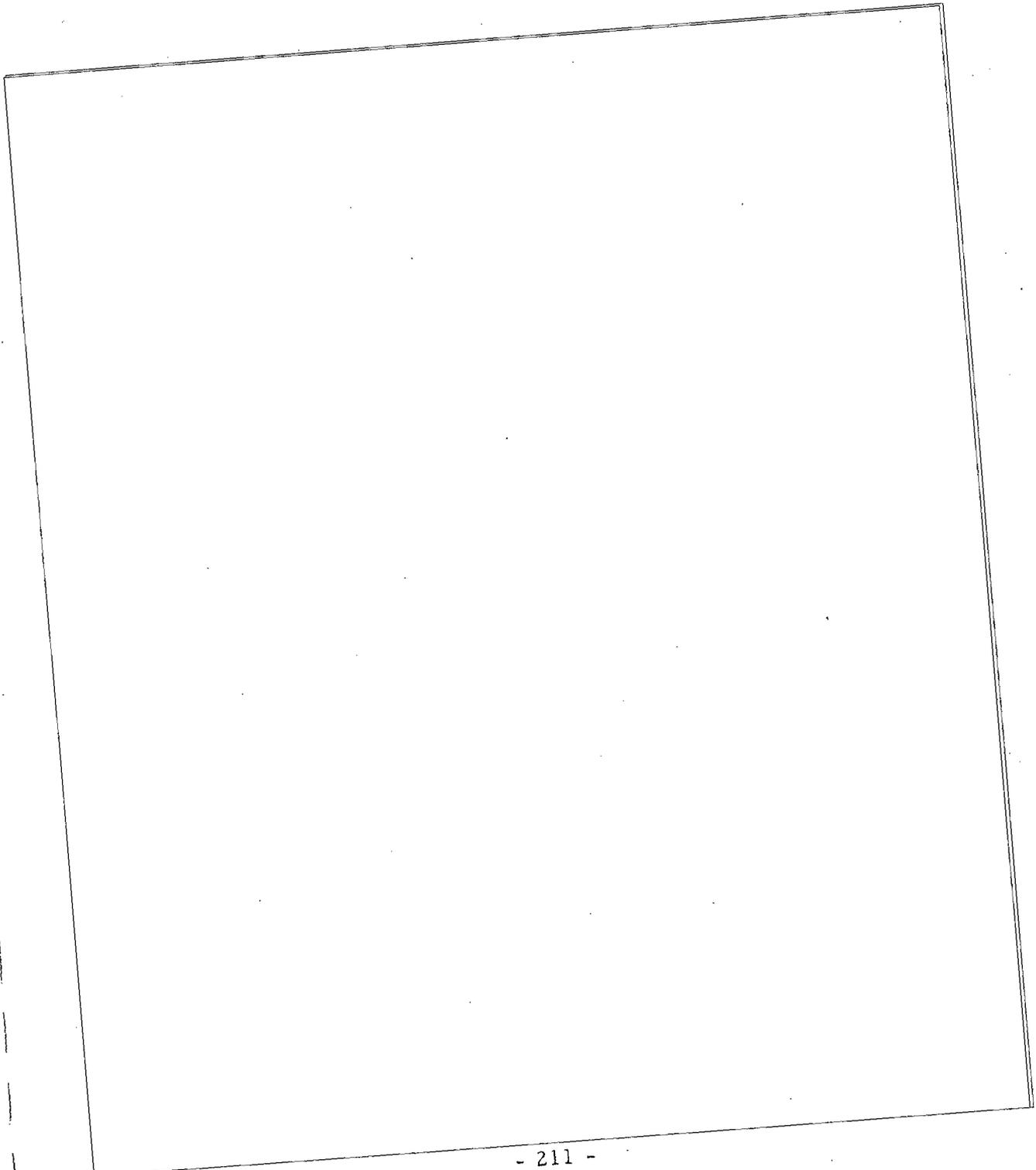
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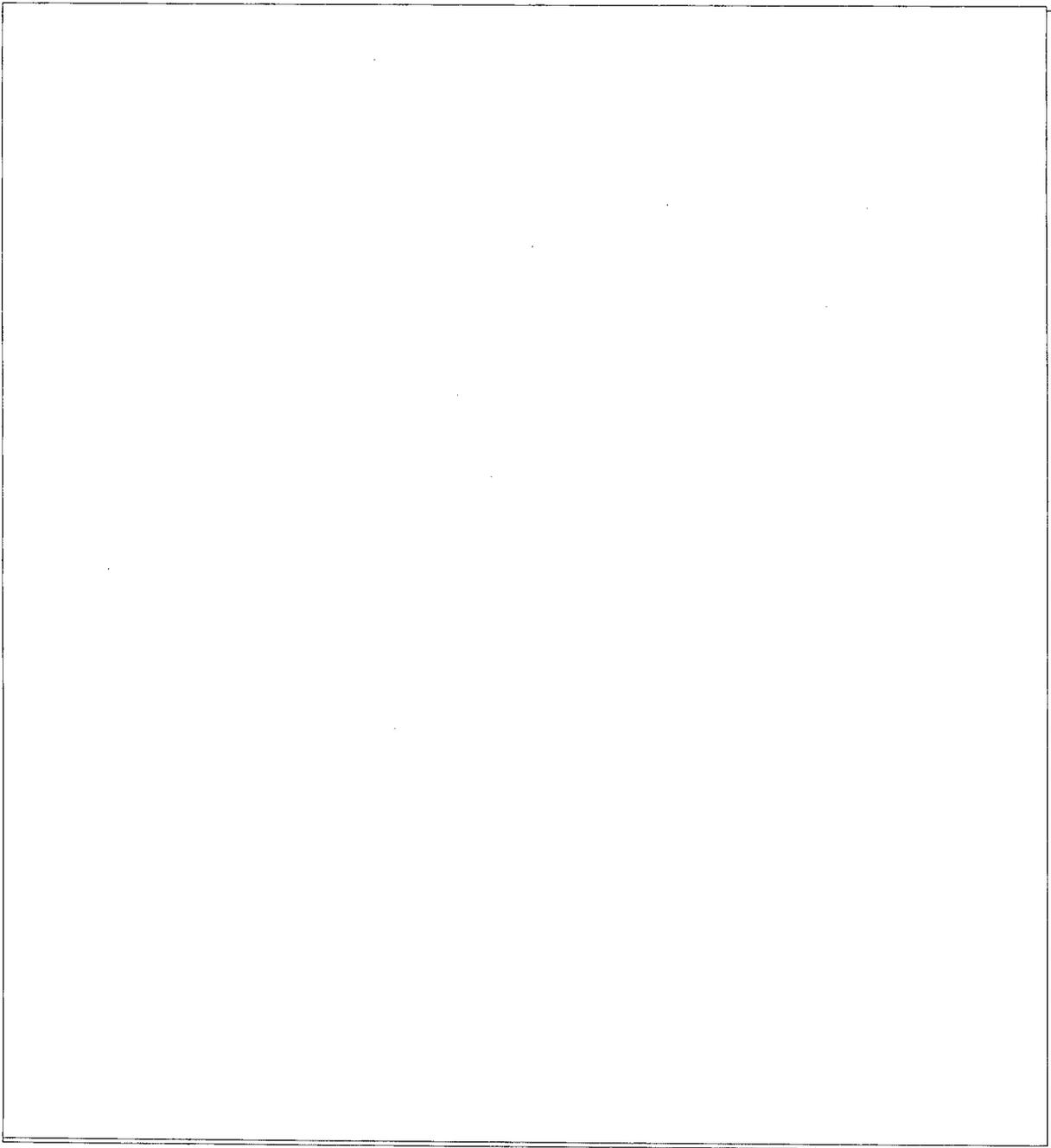
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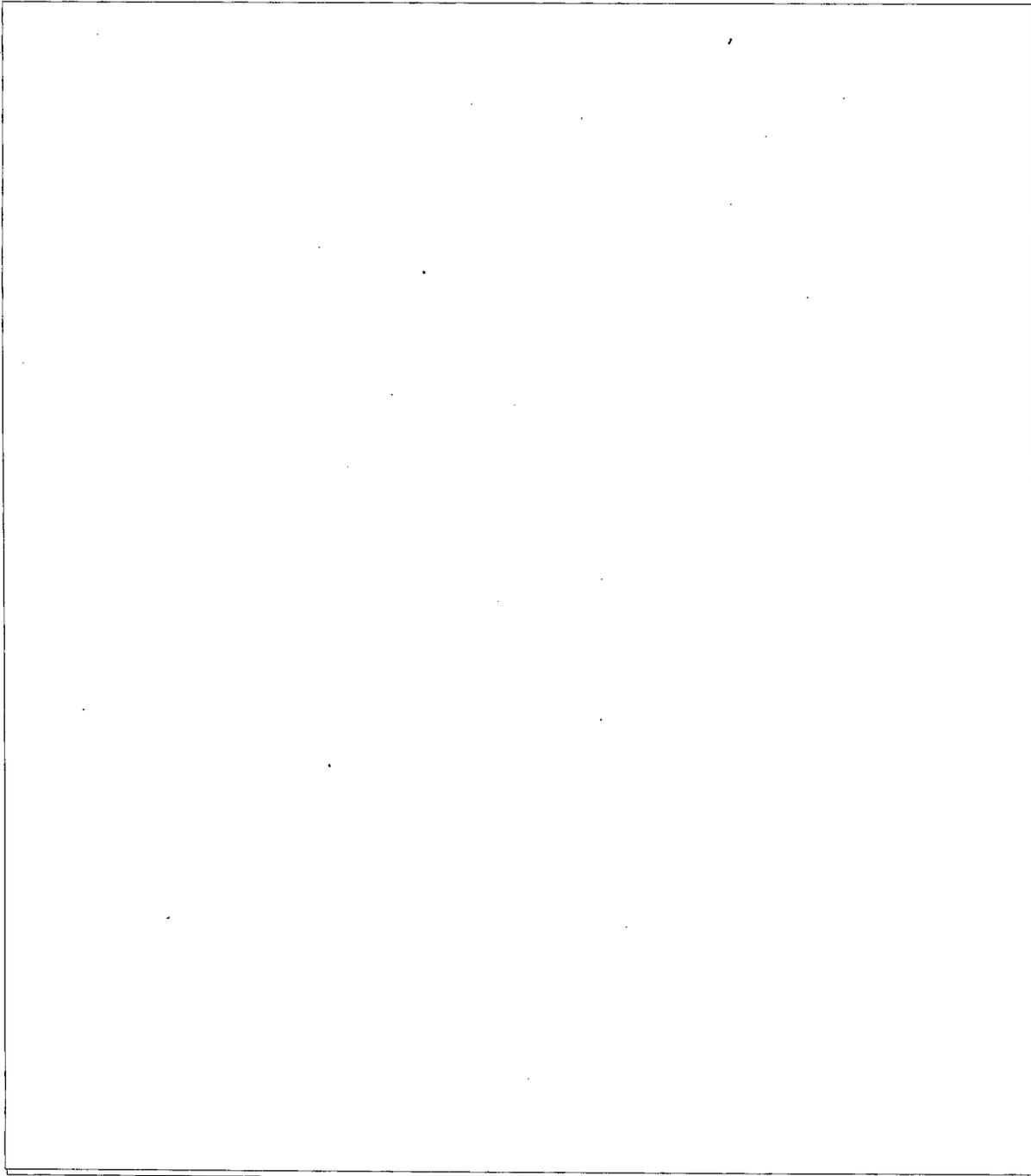
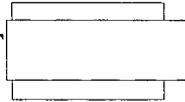
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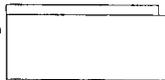


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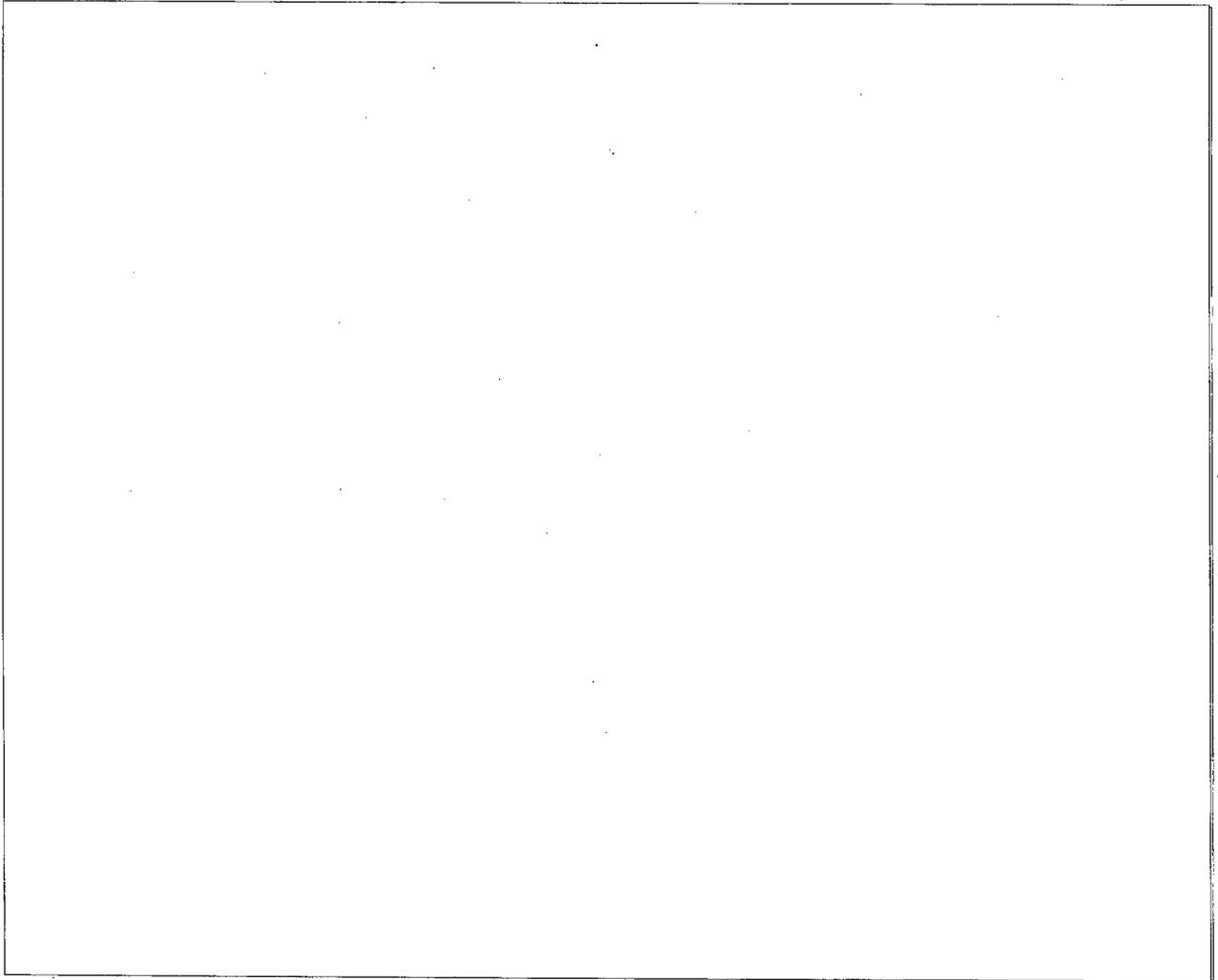
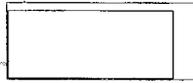


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APPENDIX B

BRIEF DESCRIPTION
OF "VOYENNAYA MYSL'" (MILITARY THOUGHT)*

The function of the military press in the USSR is to stimulate new ideas, inform and educate readers in officially accepted doctrine, and to carry news of the several services. Different journals are intended to serve for various components of the military establishment and for various levels of the military structure. The publications are divided into three principal groups: newspapers, periodicals, and books and manuals.

The periodicals, as might be expected, contain the most valuable material on military thought written by high-ranking military leaders. At least two of these periodicals, Voyennaya mysl' (Military Thought) and Morskoy sbornik (Naval Journal), have SECRET and TOP SECRET issues in addition to unclassified issues. Both of these periodicals, even the unclassified versions, are limited in distribution.

Voyennaya mysl' is the chief theoretical military journal in the USSR and has been published monthly since 1937 by the General Staff. Since 1941 it has not been available for general or foreign subscription, and since 1947 its distribution has been limited to "Generals, Admirals, and Officers of the Soviet Army and Navy only." Articles in this journal cover a wide span of important strategic and tactical problems and are written by the leading military authorities and theoreticians of the USSR. The best works of students at the higher war colleges are sometimes published in it. There is no attempt to equivocate or obscure anything in the classified versions, because the material is intended to be accepted as the latest military views. Articles in the classified versions also reflect information and conclusions based on the latest and most accurate Soviet intelligence reports.

* Information contained in this appendix was obtained from R. L. Garthoff, Soviet Strategy in the Nuclear Age, New York, Praeger, 1958, p. 256,

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Unlike most of the other military journals, the articles in Voyennaya mysl' are not indexed in the weekly Letopis zhurnalnykh statei (Calendar of Periodicals Articles) or in the subject file index of military articles in the Lenin Library.

This journal is, so far as can be ascertained, the most important medium for expressing thoughts on Soviet military doctrine and strategy. Articles reprinted from it are used in classified books that are used by the Order of Lenin and Frunze academies. There is evidence that it has played an important role in provoking some significant modifications in Soviet military doctrine in the past few years. The editor and editorial board comprise a distinguished panel of Soviet Generals, Marshals, and Admirals. The current editor is General-Leytenant N. A. Radetskiy.

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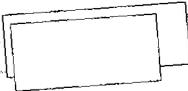
APPENDIX C

PHOTOGRAPHS OF SELECTED SHIPS AND AIRCRAFT
OF THE SOVIET NAVY

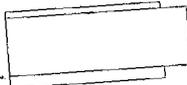
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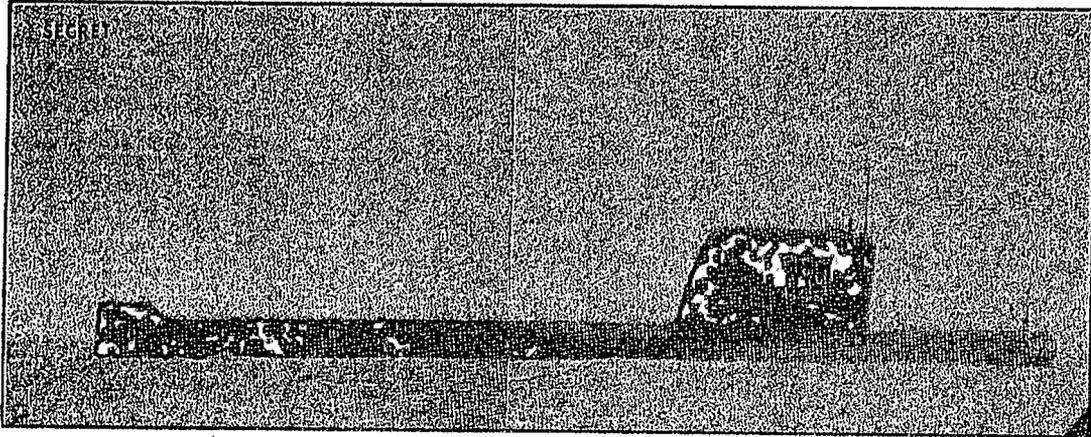


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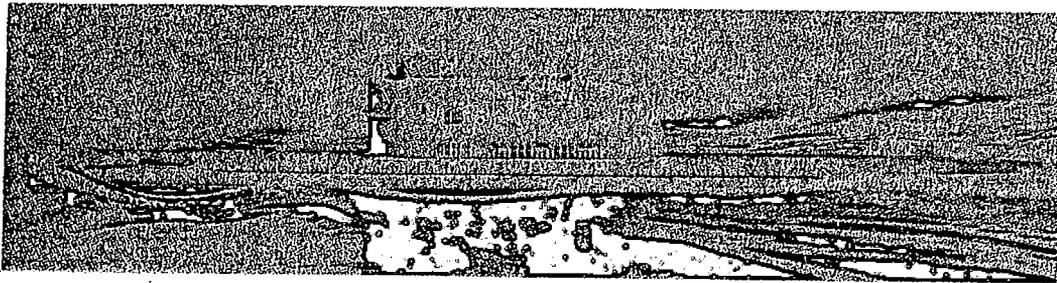


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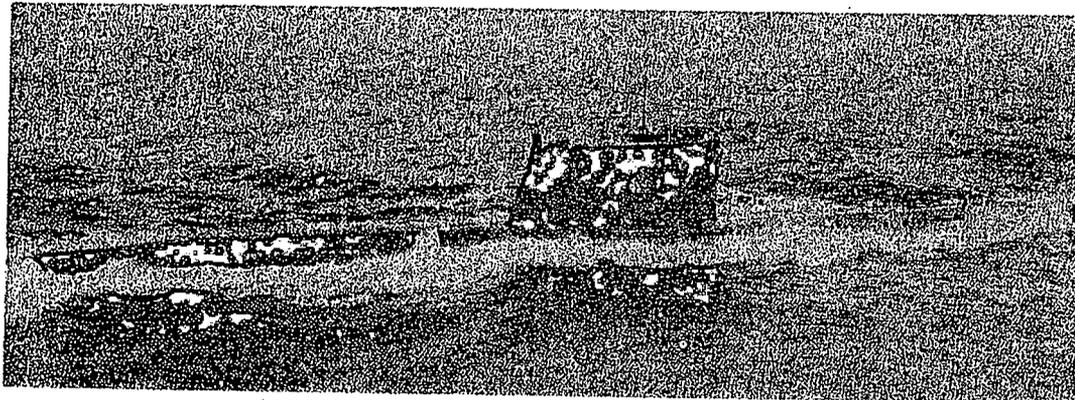
USSR: BALLISTIC MISSILE SUBMARINES



H-Class Nuclear Ballistic Missile Submarine (SSBN)



G-Class Ballistic Missile Submarine (SSB)

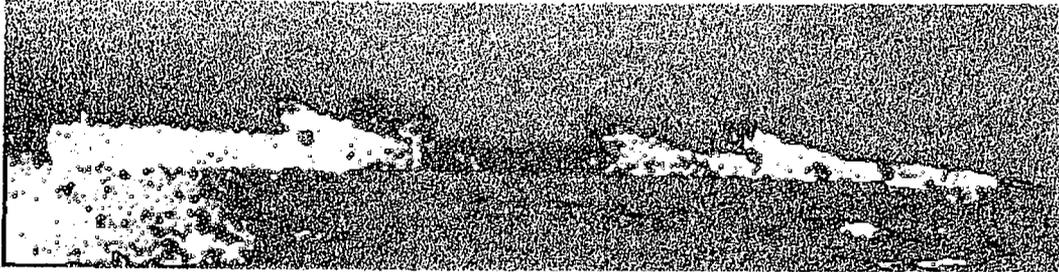


ZV-Class Ballistic Missile Submarine (SSB) (Conversion)

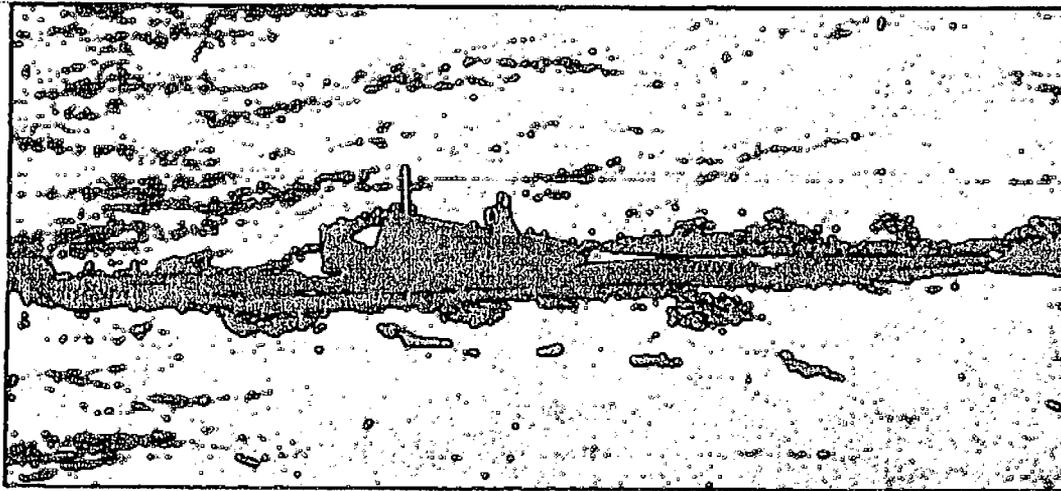
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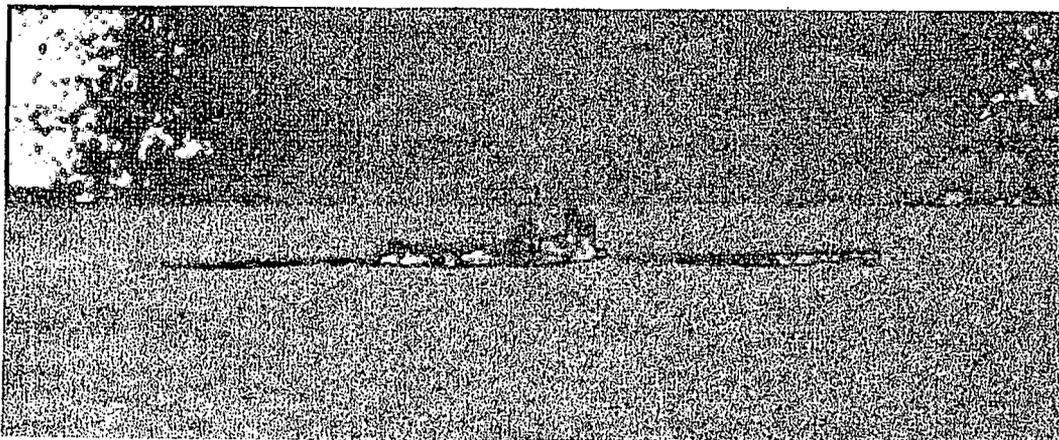
USSR: GUIDED-MISSILE SUBMARINES



E-Class Nuclear Guided-Missile Submarine (SSGN)

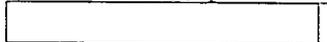


Long Bin-Class Guided-Missile Submarine (SSG)



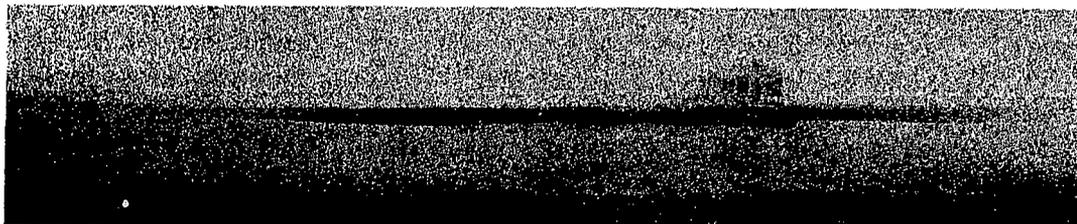
Twin Cylinder-Class Guided-Missile Submarine (SSG) (Conversion)

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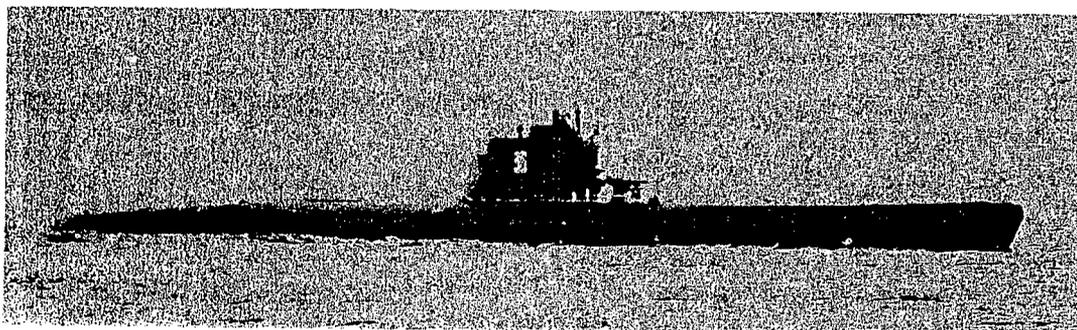
USSR: TORPEDO ATTACK SUBMARINES



N-Class Nuclear Submarine (SSN)



F-Class Submarine (SS)



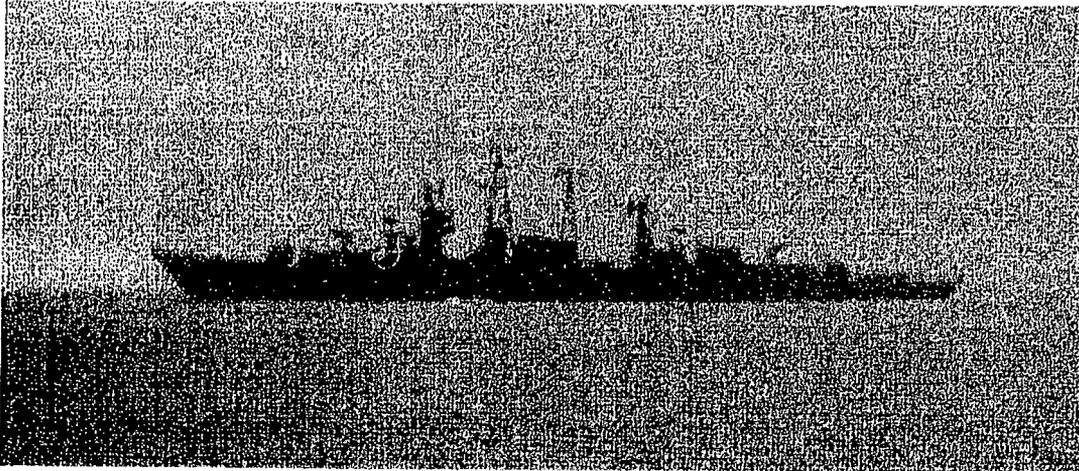
Z-Class Submarine (SS)

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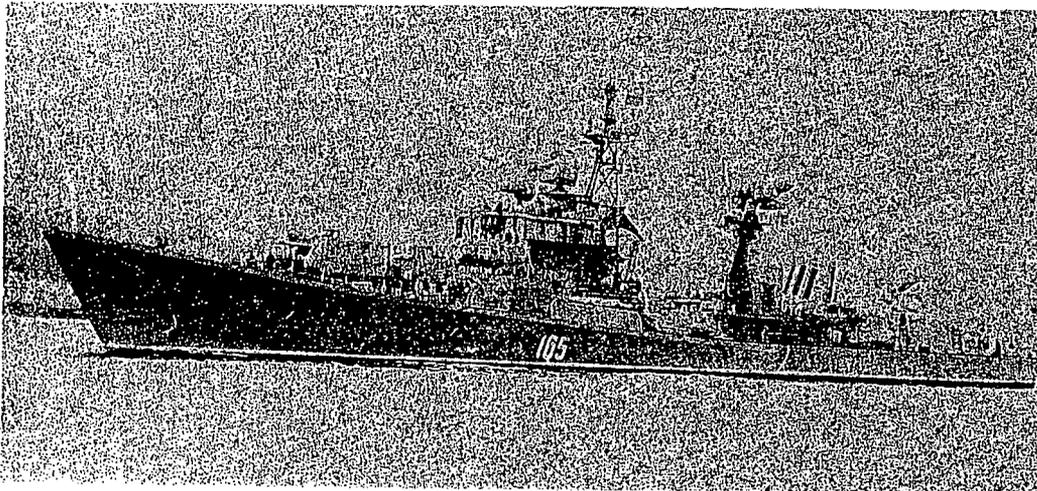


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USSR: SURFACE-TO-AIR MISSILE DESTROYERS

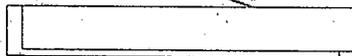


Kashin- Class Guided Missile Frigate (DLG)



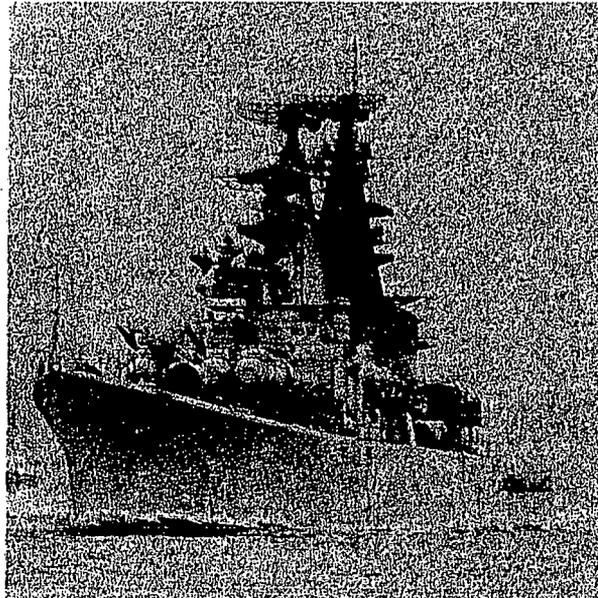
Kotlin -Class Guided-Missile Destroyer (DDG)(Conversion)

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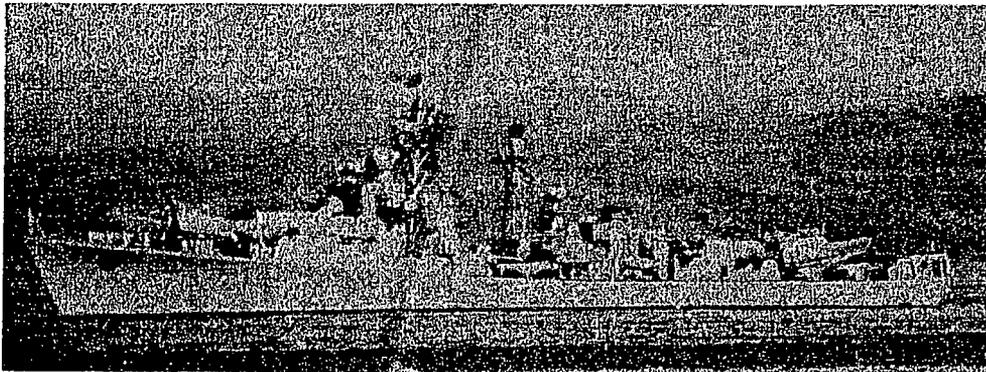


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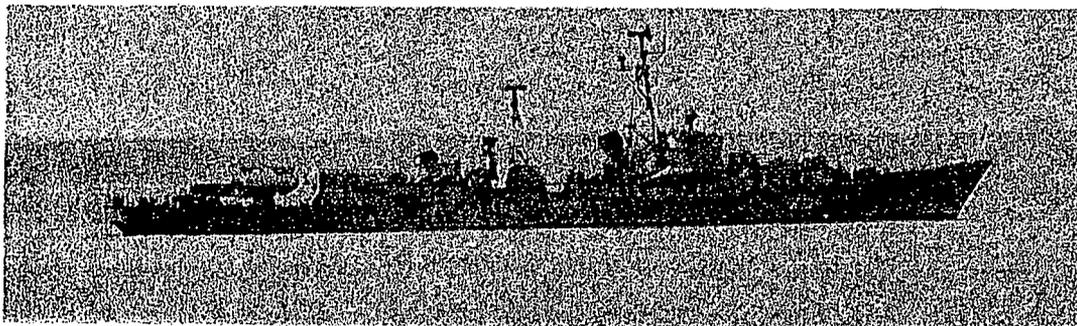
USSR: SURFACE-TO-SURFACE MISSILE DESTROYERS



Kynda-Class Guided-Missile Frigate (DLG)



Krupnyy-Class Guided-Missile Destroyer (DDG)



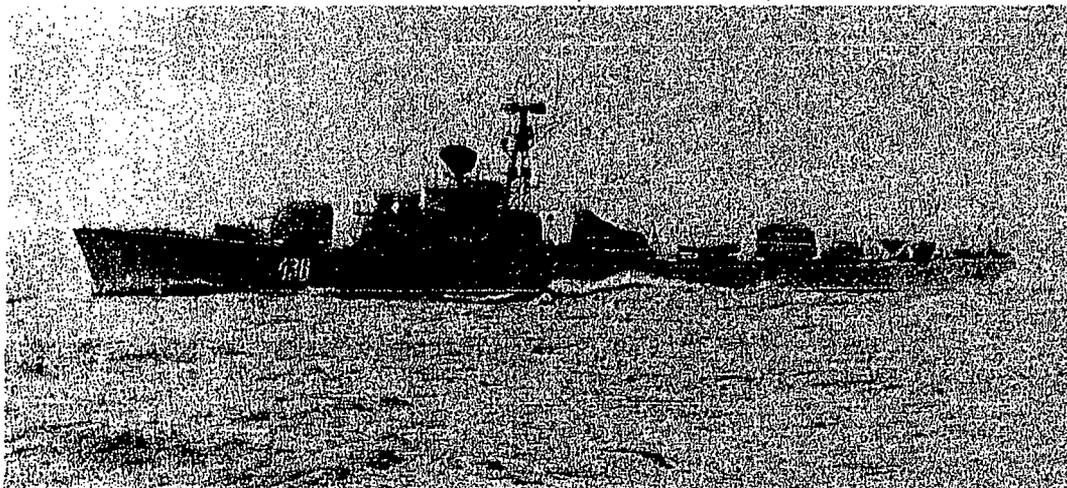
Kildin-Class Guided-Missile Destroyer (DDG)

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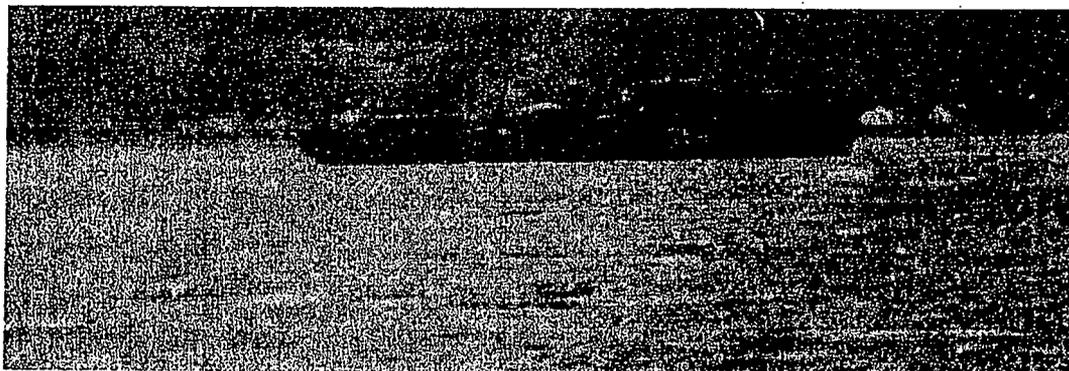


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USSR: ANTISUBMARINE SHIPS

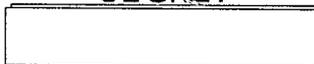


Petya-Class Escort (PCE)



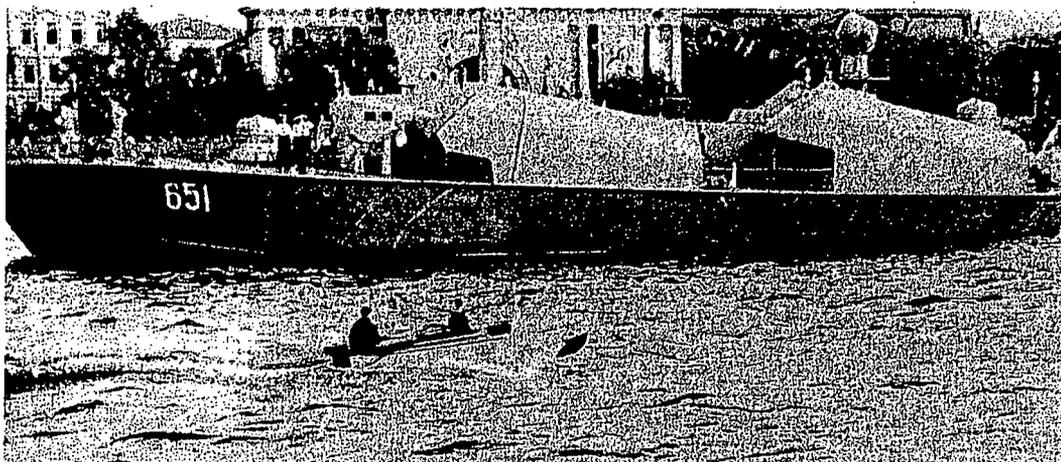
Poti-Class Large Submarine Chaser (PC)

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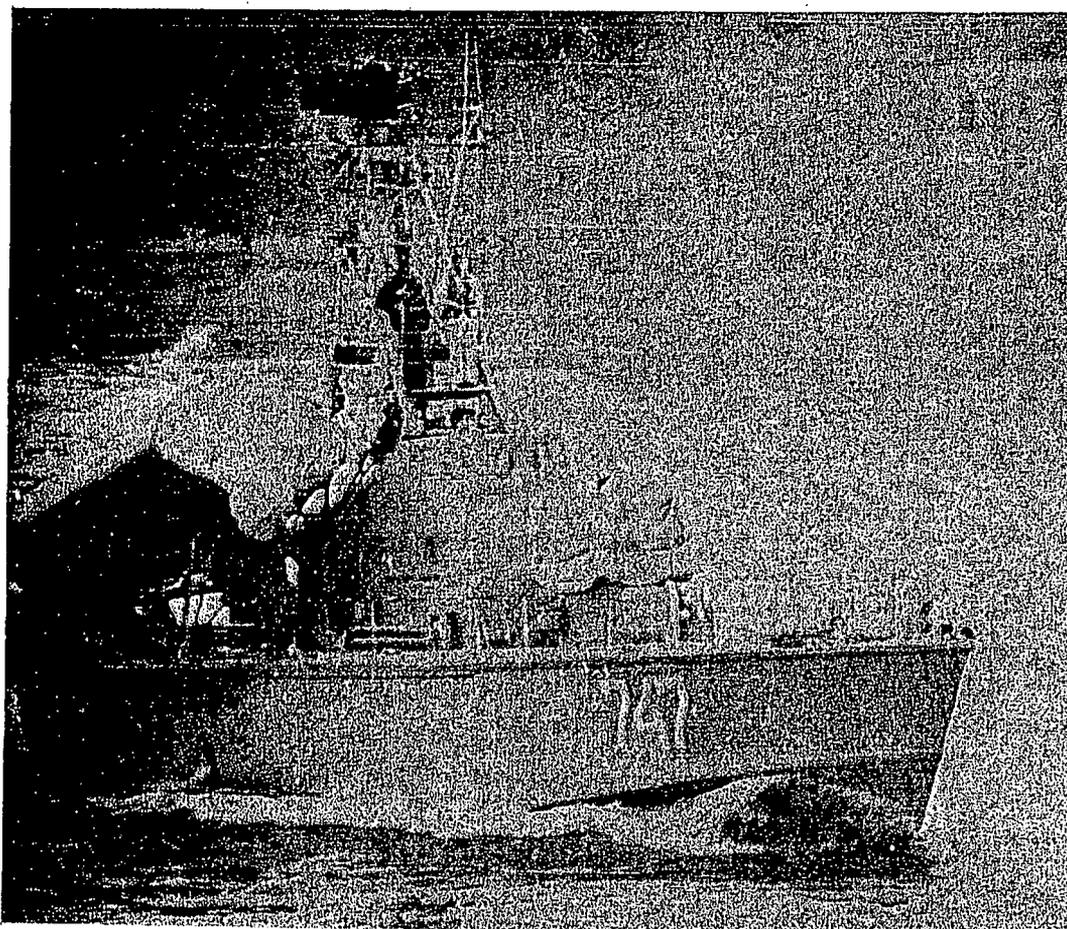


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USSR: GUIDED-MISSILE MOTOR GUNBOATS



Osa-Class Guided Missile-Motor Gunboat (PGMG)

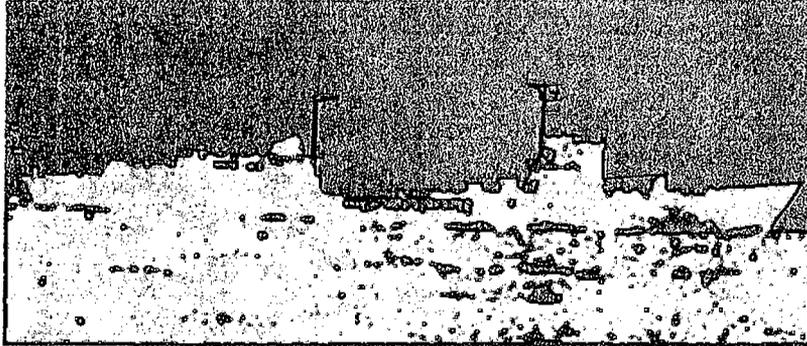


Komar-Class Guided-Missile Motor Gunboat (PGMG) (Conversion)

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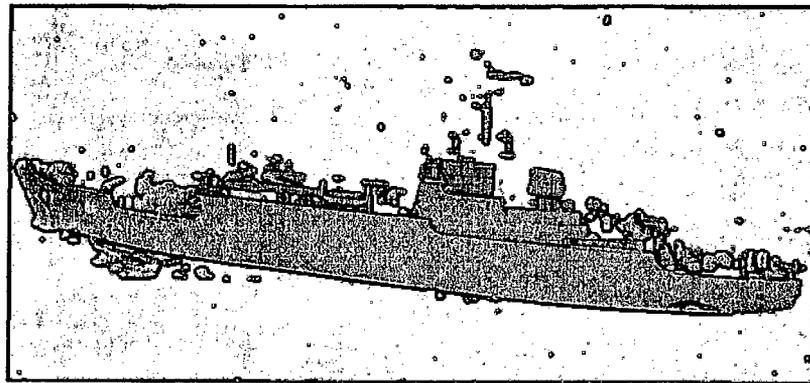
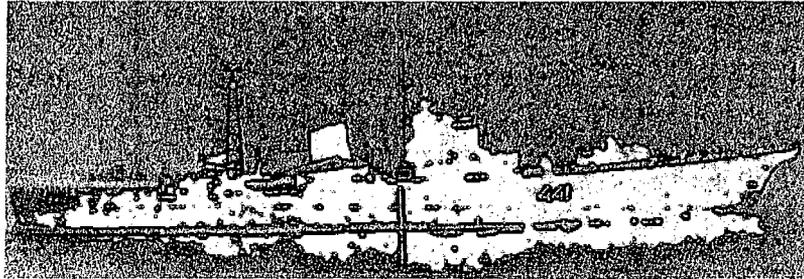
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USSR: NAVAL AUXILIARIES



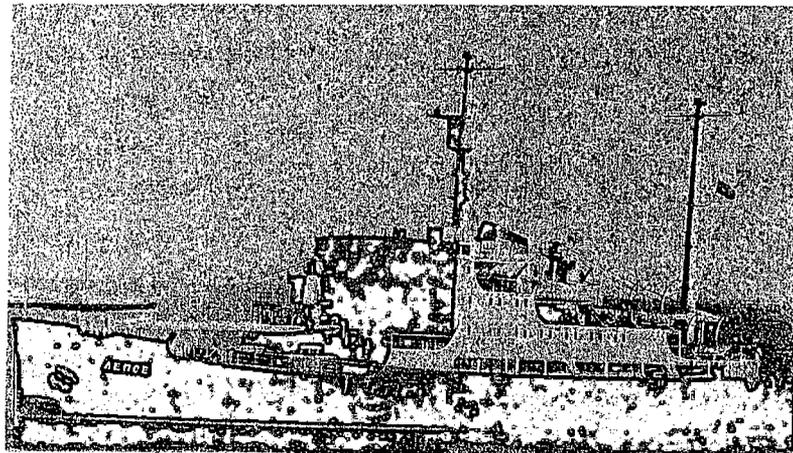
Uda-Class Oiler (AO)

Don-Class Submarine
Tender (AS)



Lama-Class Missile
Support Ship

Lepse-Class Nuclear
Support Ship
(Conversion)

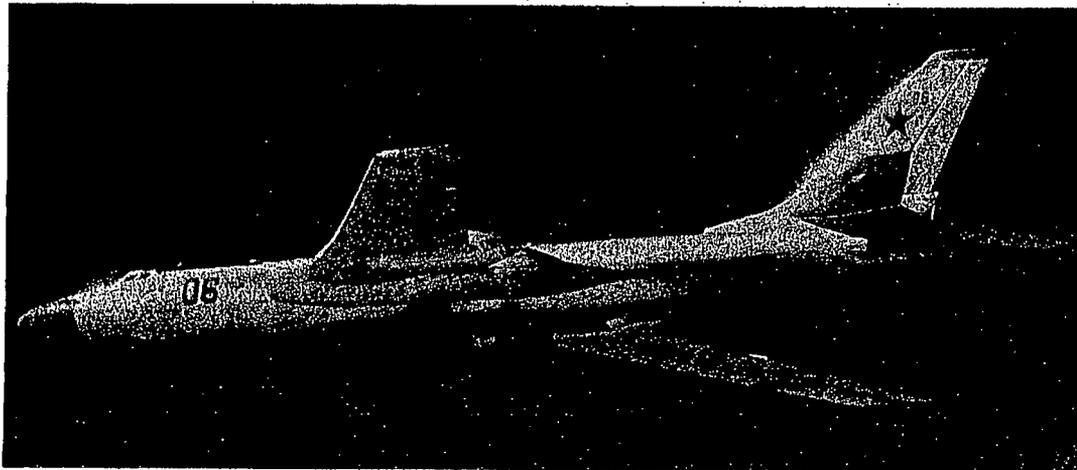


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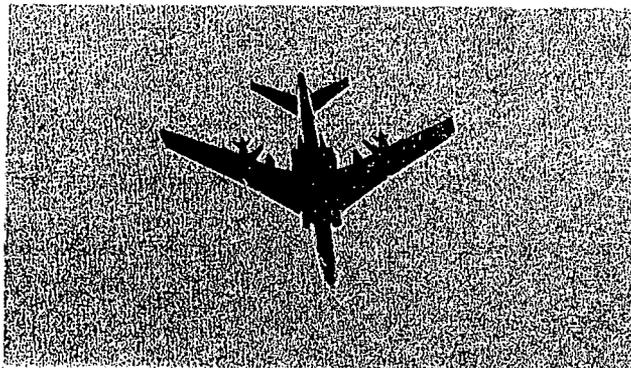


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USSR: BOMBER AIRCRAFT

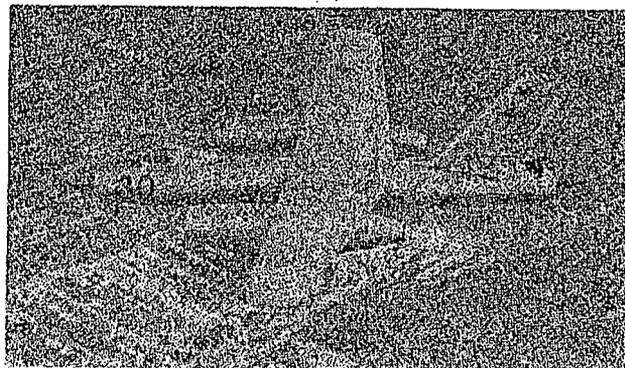


Tu-16 (Badger) Jet Medium Bomber With Kipper Air-to-Surface Missile



Tu-16 (Badger)
Jet Medium Bomber With Two
Kennel Air-to-Surface Missiles

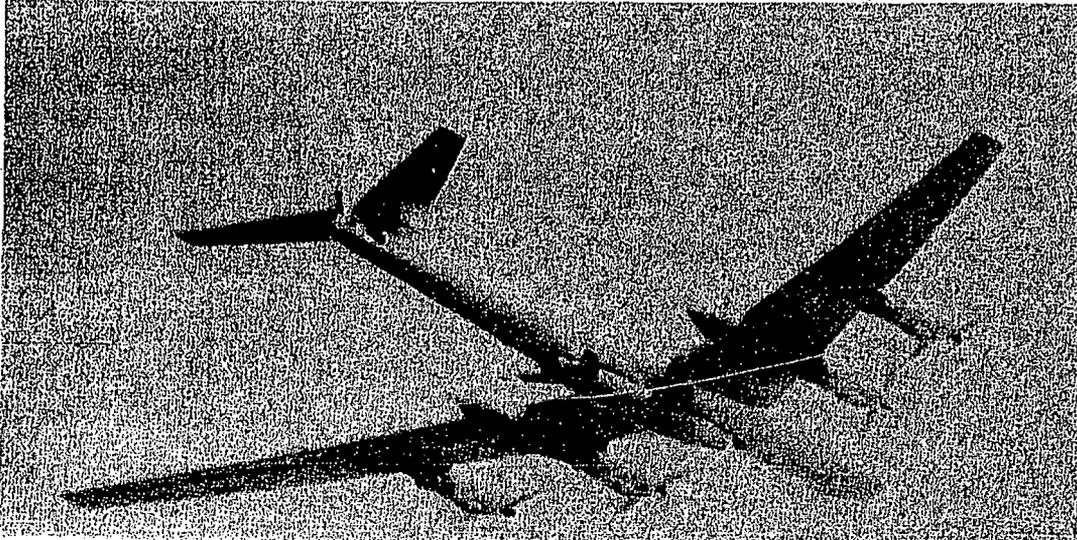
Il-28 (Beagle)
Jet Light Bomber



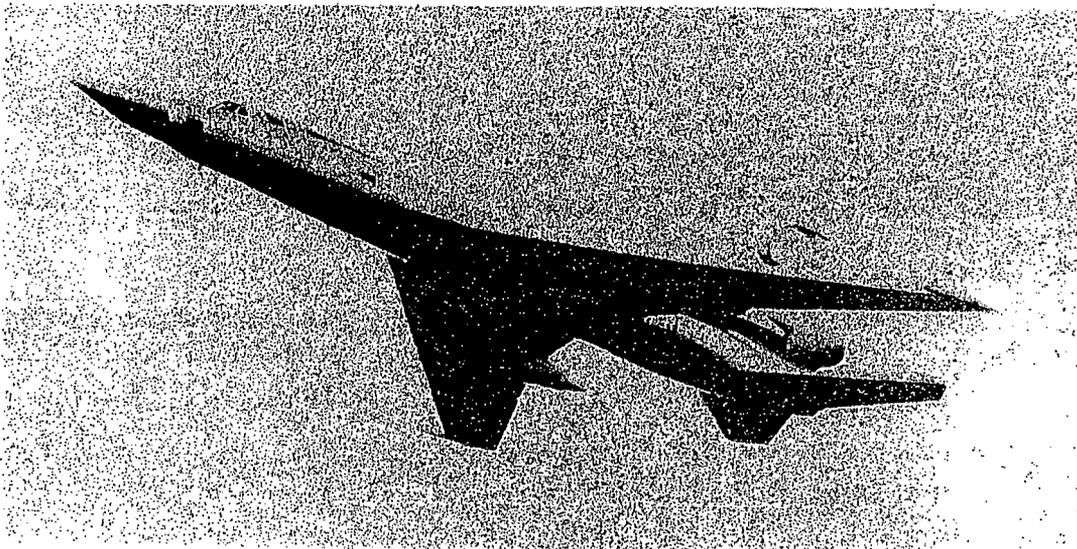
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USSR: BOMBER AIRCRAFT



Tu-95 (Bear) Turbo-Prop Long-Range Bomber With Kangaroo Air-To-Surface Missile

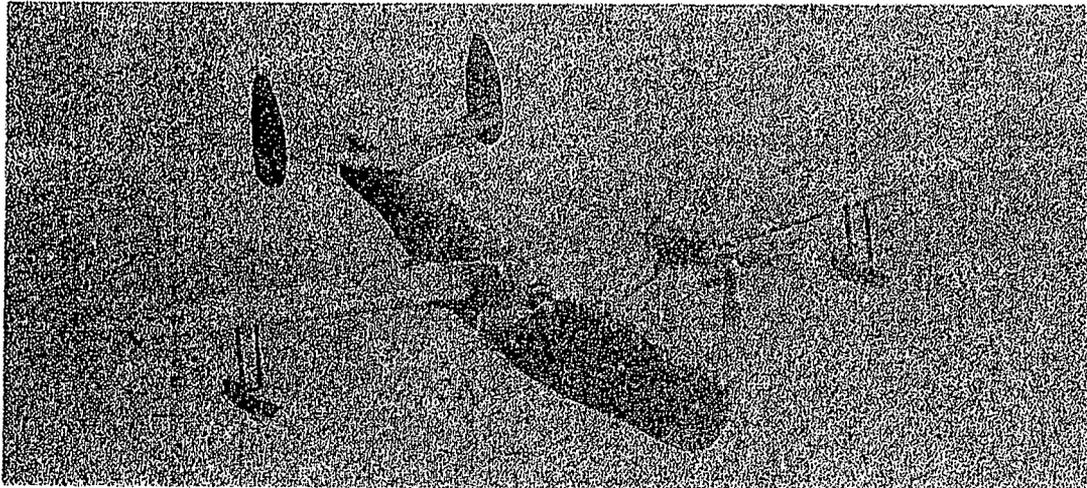


Blinder Supersonic-Dash Jet Medium Bomber

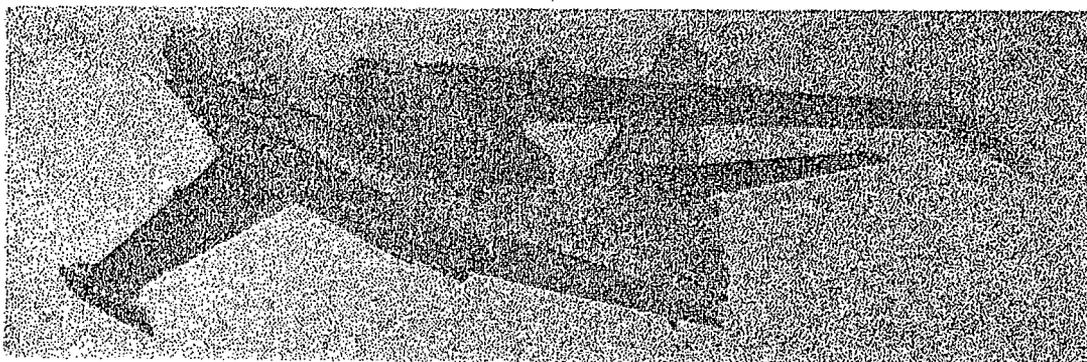
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USSR: PATROL AIRCRAFT



Be-6 (Madge) Reciprocating Engine Flying Boat



Mallow Jet Flying Boat



Mail Turbo-Prop Flying Boat

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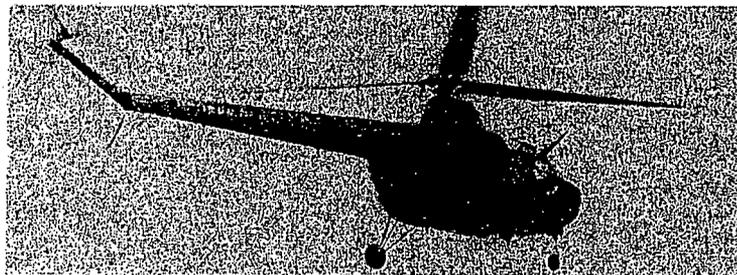
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USSR: HELICOPTERS



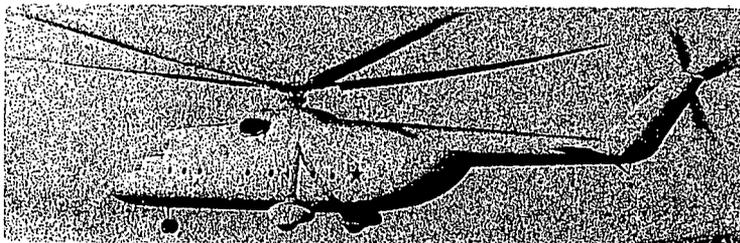
Ka-15 (Hen) Helicopter



Mi-4 (Hound) Helicopter



Mi-1 (Hare) Helicopter



Mi-6 (Hook) Helicopter

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APPENDIX D

ORDER OF BATTLE OF THE SOVIET FLEETS

Northern Fleet Order of Battle (Principal Types)

Submarines

Attack Submarines 120

Long Range

N class, nuclear-powered 10
F class, diesel-powered 12
Z class, diesel-powered 13
W class, diesel-powered 68
R class, (W-class conversion) 17

Ballistic-Missile Submarines 38

H class, nuclear-powered 10
G class, diesel-powered 24
Z class (conversion) 4

Cruise-Missile Submarines 5

W class (conversion) Long Bin 2
W class (conversion) Twin Cylinder 3

Radar Picket Submarine 1

W class (conversion) 1

Surface Ships

Cruisers 4

Sverdlov class 3

Chapayev class 1

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Guided-Missile Destroyers	<u>3</u>
<u>Krupnyy class</u>	3
Destroyers	<u>27</u>
<u>Kotlin class</u>	7
<u>Skoryy class</u>	20
Escorts	<u>22</u>
<u>Riga class</u>	14
<u>Kola class</u>	8
Minor Surface Ships	<u>515</u>
Patrol craft	129 (Including 4 Osa-class guided-missile patrol boats)
Mine craft	93
Amphibious	108
Auxiliaries	158
Service craft	27
Black Sea Fleet Order of Battle (Principal Types)	
Submarines	
Attack Submarines	<u>41</u>
Long Range	
W class, diesel-powered	25
R class (W class conversion)	3
Medium Range	
Q class, diesel-powered	4

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Short Range	
M class, diesel-powered	9
Cruise-Missile Submarines	<u>1</u>
W class (conversion) <u>Twin Cylinder</u>	1
Radar Picket Submarine	1
W class (conversion)	1
Surface Ships	
Cruisers	<u>5</u>
<u>Kirov class</u>	1
<u>Sverdlov class</u>	3 (Including one ship with possible SSM launcher and one ship with SAM launcher)
<u>Chapayev class</u>	1
Guided-Missile Destroyer Antiaircraft	<u>1</u>
<u>Kotlin class (conversion)</u>	1
Guided-Missile Destroyer	<u>4</u>
<u>Krupnyy class</u>	2
<u>Kildin class</u>	2
Guided-Missile Frigate Antiaircraft	1
<u>Kashin class</u>	<u>1</u>

Destroyers	13
<u>Kotlin class</u>	3
<u>Skoryy class</u>	10
Escorts	10
<u>Riga class</u>	10
Minor Surface Ships	656
Patrol craft	212 (Including 21 <u>Komar-</u> class and 13 <u>Osa-</u> class guided- missile patrol boats)
Mine craft	84
Amphibious	182
Auxiliaries	105
Service craft	73
Baltic Fleet Order of Battle (Principal Types)	
Submarines	
Attack Submarines	<u>82</u>
Long Range	
F class diesel-powered	7
Z class diesel-powered	1
W class diesel-powered	35
Medium Range	
Q class diesel-powered	26
Short Range	
M class diesel-powered	13

Cruise-Missile Submarines	<u>2</u>
W class (conversion) <u>Long Bin</u>	2
Surface Ships	
Cruisers	<u>5</u>
<u>Kirov class</u>	1
<u>Sverdlov class</u>	3
<u>Chapayev class</u>	1
Guided-Missile Destroyers Antiaircraft	1
<u>Kotlin class (conversion)</u>	1
Guided-Missile Destroyers	<u>2</u>
<u>Krupnyy class</u>	1
<u>Kildin class</u>	1
Guided-Missile Frigates	<u>2</u>
<u>Kynda class</u>	2
Destroyers	<u>18</u>
<u>Kotlin class</u>	4
<u>Tallinn class</u>	1
<u>Skoryy class</u>	12
<u>Otlicknyy class</u>	1
Escorts	<u>11</u>
<u>Riga</u>	11

Minor Surface Ships	<u>962</u>
Patrol craft	271 (Including 11 <u>Komar</u> - class and 24 <u>Osa</u> - class guided- missile patrol boats)
Mine craft	187
Amphibious	168
Auxiliaries	257
Service craft	79
 Pacific Fleet Order of Battle (Principal Types)	
Submarines	
Attack Submarines	<u>74</u>
Long Range	
F class, diesel-powered	6
Z class, diesel-powered	5
W class, diesel-powered	44
Short Range	
M class, diesel-powered	19
Cruise-Missile Submarines	<u>9</u>
E class, nuclear-powered	6
W class (conversion) <u>Long Bin</u>	2
W class (conversion) <u>Twin Cylinder</u>	1
Ballistic-Missile Submarines	<u>10</u>
G class, diesel-powered	7
Z class (conversion)	3

Radar Picket Submarines	<u>2</u>
W class (conversion)	2
Surface Ships	
Cruisers	<u>6</u>
<u>Kirov class</u>	2
<u>Sverdlov class</u>	4
Guided-Missile Destroyers	<u>3</u>
<u>Krupnyy class</u>	2
<u>Kildin class</u>	1
Destroyers	<u>27</u>
<u>Kotlin class</u>	11
<u>Skoryy class</u>	16
Escorts	<u>19</u>
<u>Riga class</u>	19
Minor Surface Ships	<u>627</u>
Patrol craft	236 (Including 26 <u>Komar-</u> class and 22 <u>Osa-</u> class guided- missile patrol boats)
Mine craft	37
Amphibious	118
Auxiliaries	205
Service craft	31

Northern Fleet Naval Air Force Order of Battle

<u>Aircraft</u>	<u>Bomber</u>	<u>Reconnaissance</u>	<u>Transport</u>	<u>Helicopter</u>
Badger	84	18		
Madge		20		
Cab			22	
Camel			1	
Camp			2	
Cat			2	
Crate			15	
Cub			4	
Hound				24

Pacific Fleet Naval Air Force Order of Battle

<u>Aircraft</u>	<u>Bomber</u>	<u>Reconnaissance</u>	<u>Transport</u>	<u>Helicopter</u>
Badger	81	18		
Madge		30		
Beagle	45*			
Cab			12	
Camel			3	
Camp			3	
Crate			3	
Hound				30

* Not equipped to carry ASM's.

Baltic Fleet Naval Air Force Order of Battle

<u>Aircraft</u>	<u>Bomber</u>	<u>Reconnaissance</u>	<u>Transport</u>	<u>Helicopter</u>
Badger	48	18		
Madge		10		
Blinder		9		
Beagle	25*			
Cab			15	
Camel			1	
Hound				26

Black Sea Fleet Naval Air Force Order of Battle

<u>Aircraft</u>	<u>Bomber</u>	<u>Reconnaissance</u>	<u>Transport</u>	<u>Helicopter</u>
Badger	66	18		
Madge		10		
Cab			10	
Camel			1	
Crate			2	
Cub			14	
Hound				10

* Not equipped to carry ASM's.

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APPENDIX E

SOURCE REFERENCES

The 12 articles that were written by 10 Soviet naval officers and published in the Special Collection series of the Soviet journal Voyennaya mysl' (Military Thought) are listed below.* The classification of each of these articles is SECRET.

1960 Second Issue:

1. CIA. CSDB 3/648, 058, 15 Sep 61. Kasatonov, V., Admiral. The Use of Naval Forces in Closed Sea Theaters in the Initial Period of a War.

1960 Third Issue:

2. CIA. CSDB 3/649, 107, 29 Jan 62. Bogolepov, V., Rear Admiral. The Role of Aviation in Military Operations at Sea.
3. CIA. CSDB 3/649, 344, 23 Feb 62. Tributs, V., Admiral. To Develop the Theory of Soviet Military Art.

1961 First Issue:

4. CIA. CSDB 3/648, 830, 12 Dec 61. Lisutin, V., Rear Admiral. The Utilization of the Forces of the Navy in a Missile/Nuclear War.

* The first 11 from a TOP SECRET version, the 12th from a SECRET version.

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1961 Second Issue:

5. CIA. CSDB 3/647,994, 5 Sep 61. Platonov, V., Admiral. The Missions of the Navy and Methods of Carrying Them Out.
6. CIA. CSDB 3/648,827, 11 Dec 61. Zvyagin, N., Rear Admiral. The Use of Surface Vessels in Modern Naval Warfare.

1961 Third Issue:

7. CIA. CSDB 3/649,281, 21 Feb 62. Panteleyev, Yu., Admiral. The Submarine Operation of the Navy -- the Naval Operation of the Future.

1961 Fourth Issue:

8. CIA. CSDB 3/649,998, 15 May 62. Kasatonov, V., Admiral. On the Problems of the Tasks of the Navy and Methods for Accomplishing Them.
9. CIA. CSDB 3/650,126, 29 May 62. Zhukovskiy, O., Rear Admiral. Combat Against Enemy Missile Submarines.

1962 First Issue:

10. CIA. CSDB 3/651,147, 14 Sep 62. Kharlamov, N., Admiral. The Tasks of the Navy and the Methods of Performing Them.
11. CIA. CSDB 3/651,445, 8 Oct 62. Bogolepov, V., Rear Admiral. On the Question of the Tasks, Organization, and Planning of Military-Scientific Work.

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1962 Third Issue:

12. CIA. CSDB 3/651,437, 5 Oct 62. Mameyev, Ye.,
Captain First Rank. New Developments in Combat
with Carrier Attack Forces in the Initial Period
of War.

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